ORDER NO. KM40109857C3

Service Manual

Telephone Equipment

KX-TS105LXW

Integrated Telephone System
White Version
(for Latin America)

SPECIFICATIONS

■ SPECIFICATIONS

Power Source:	Telephone line voltage
Dial Speed:	Tone(DTMF)/Pulse(10pps)
Redial:	Last dialed telephone number
Speaker Unit:	5.7cm (2.5") PM magnetic type 32Ω
	Handset; 3 cm ($1^{13}/_{16}$) PM dynamic type, 150Ω
Microphone:	Electret condenser microphone
Input Jack:	Telephone Line, Data port
Dimensions:	$6^{9}/_{16}$" × $8^{13}/_{16}$" × $3^{3}/_{4}$" (167 × 224 × 95 mm)
Weight:	1.46 lbs. (660g)

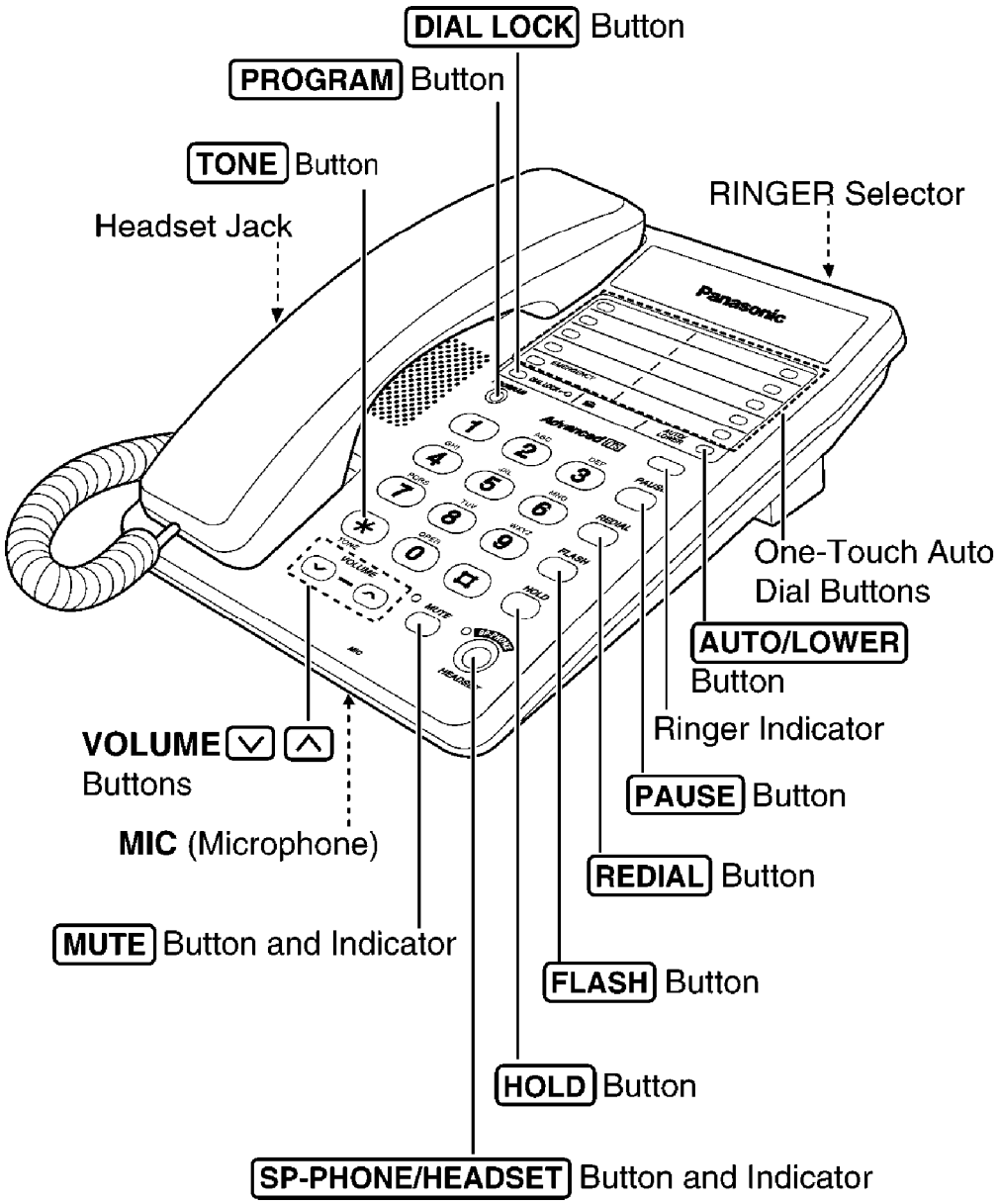
Design and specifications are subject to change without notice.

Panasonic

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

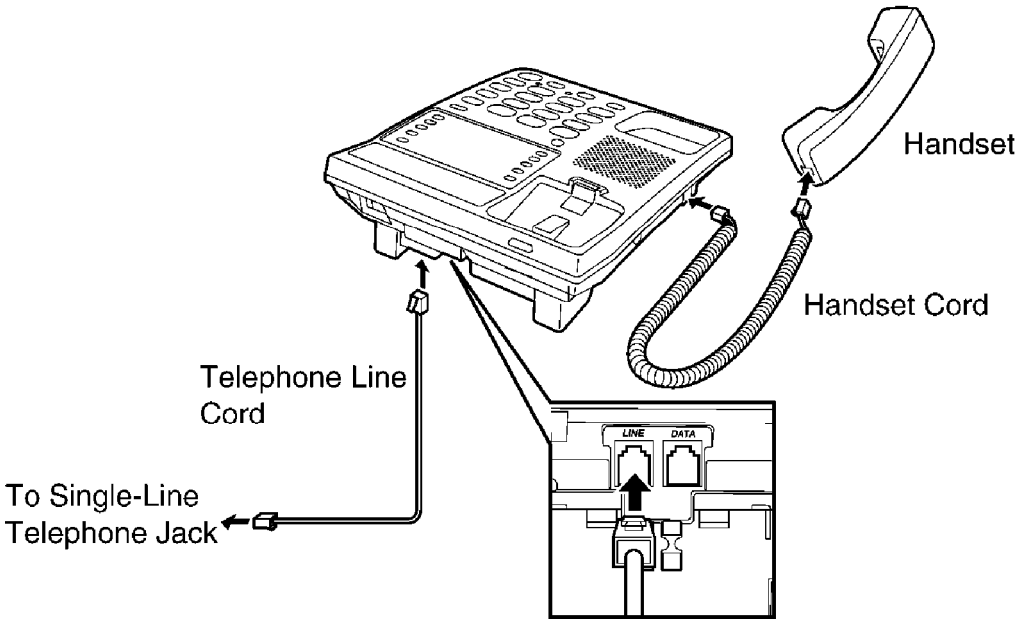
1. LOCATION OF CONTROLS



2. CONNECTION

2.1. Connecting the Handset/Telephone Line Cord

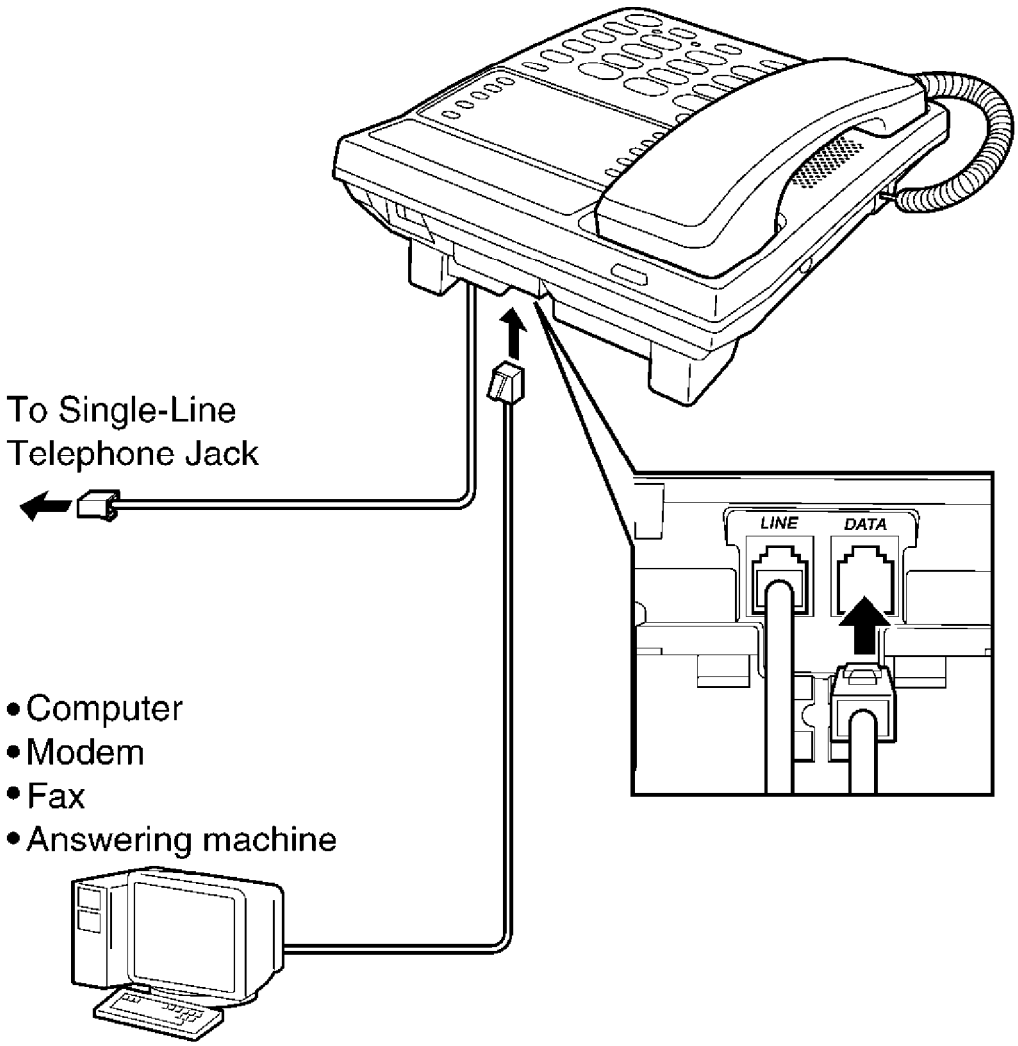
After connection, lift the handset to check for a dial tone.



- Use only a Panasonic Handset for the KX-TS105LXW.

2.2. Connecting a Communication Device

If you connect a communication device (computer, modem, fax, answering machine, etc.) to the telephone line, you can connect it through this unit using the DATA jack.
After connecting the handset and telephone line cord, connect the communication device telephone line cord to the DATA jack.



- Make sure the communication device is not in use before using this unit (making calls, storing phone numbers in memory etc.) or the communication device may not operate properly.

3. SETTINGS

3.1. Selecting the Dialing Mode

You can select the dialing mode by programming. If you have touch tone service, set to "Tone". If rotary or pulse service is used, set to "Pulse". Your phone comes from the factory set to "Tone". Make sure that a call is not put on hold.

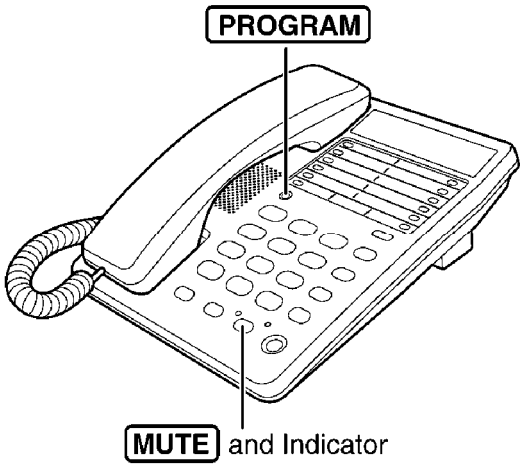
1 Press [PROGRAM].
•The MUTE indicator flashes.

2 Press [MUTE].

3 Press [3].

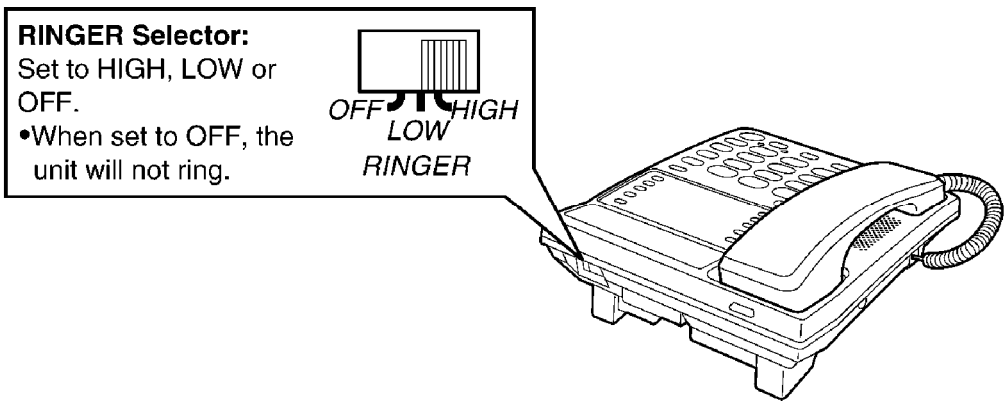
4 To select “Pulse”, press [2].
or
To select “Tone”, press [1].

5 Press [PROGRAM].
•A long beep sounds.
•The MUTE indicator light goes out.
•The unit will return to the standby mode.



3.2. Selecting the Ringer Volume

You can select the ringer volume to HIGH, LOW or OFF. Your phone comes from the factory set to HIGH.



4. SPECIAL FEATURES

4.1. FLASH Button

Pressing [FLASH] allows you to use special features of your host PBX such as transferring an extension call or accessing special telephone services (optional) such as call waiting.

4.2. Selecting the Flash Time

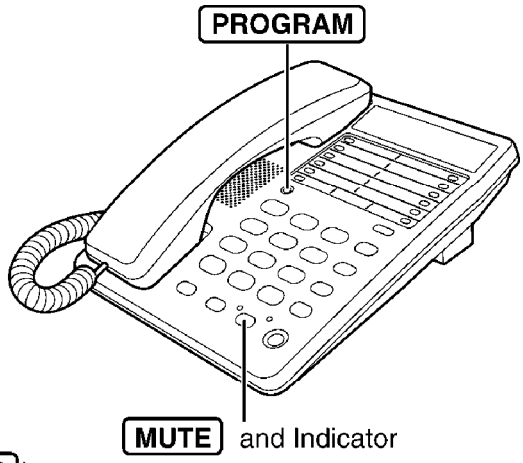
The flash time depends on your telephone exchange or host PBX. You can select the following flash times: "80, 90, 100, 110, 200, 250, 300, 400, 600, 700 ms (milliseconds)". Your phone comes from the factory set to "600 ms".

Make sure that a call is not put on hold.

1 Press **PROGRAM**.
The MUTE indicator flashes.

2 Press **MUTE**.

3 Press **2**.



4 Press a dialing button (**1** to **0**).
1 : 80 ms **2** : 90 ms **3** : 100 ms **4** : 110 ms
5 : 200 ms **6** : 250 ms **7** : 300 ms **8** : 400 ms
9 : 600 ms **0** : 700 ms

5 Press **PROGRAM**.
- A long beep sounds.
- The MUTE indicator light goes out.
- The unit will return to the standby mode.

- If you are connected via a PBX, a longer flash time may be necessary to use PBX functions (transferring a call, etc.). Consult your PBX installer for the correct setting.

4.3. Setting the Pin Code

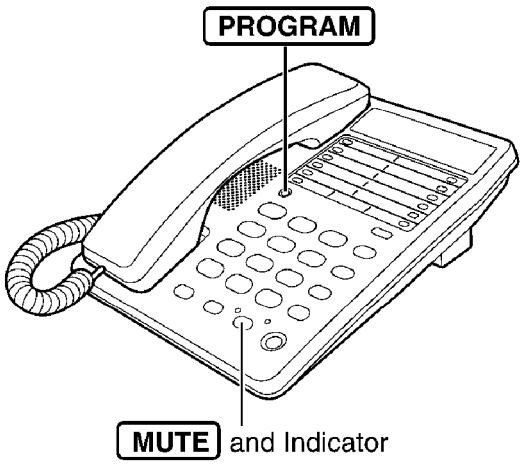
A 4-digit Pin Code (Personal Identification Number) prevents unauthorized persons from using your unit. The Pin Code is required for the dial lock and call restriction to be set or canceled. The factory preset Pin code is "1111".
Make sure that a call is not put on hold.

1 Press **PROGRAM** .
•The MUTE indicator flashes.

2 Press **MUTE** .

3 Press **5** .

4 Enter the current PIN code.



5 Press **PROGRAM** .
•If a correct PIN code is entered, a beep will sound.
•If a wrong PIN code is entered, 3 beeps will sound. Enter the correct PIN code and press **PROGRAM** .
•To return to the standby mode, lift the handset and hang up.

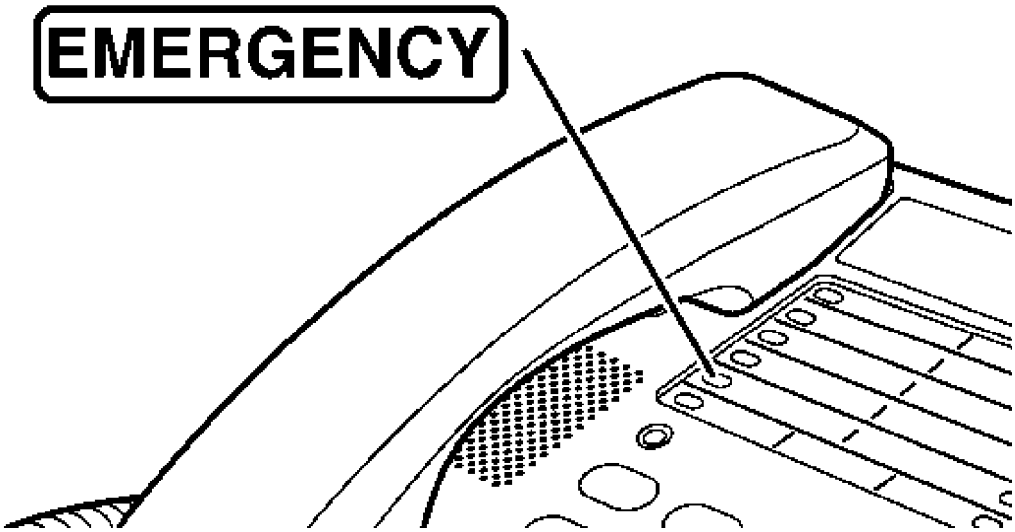
6 Enter a new PIN code using a 4-digit number.

7 Press **PROGRAM** .
•A long beep sounds.
•The MUTE indicator light goes out.
•The unit will return to the standby mode.

Please write down your Pin code. If you forget your Pin code, consult your nearest Panasonic service center.

4.4. Dial Lock

You can prevent others from making a call to any number except the one pre-programmed in the memory of the EMERGENCY button. Once you locked the dialing buttons, even emergency numbers cannot be dialed. Only incoming calls are accepted until the dial lock is canceled. Before using this feature, we recommend storing an emergency number in the memory of the EMERGENCY button. Even if the dialing buttons are locked, the number stored in the button can be dialed.



- If you choose not to program emergency numbers, but plan to use the dial lock, any number programmed into the EMERGENCY button can be accessed.

4.4.1. To Set the Dial Lock

1. Press **DIAL LOCK**.
   - The MUTE indicator flashes.
2. Enter the PIN code.
3. Press **PROGRAM**.
   - A long beep sounds.
   - If a wrong PIN code is entered, 3 beeps will sound. Enter a correct PIN code and press **PROGRAM**.
   - The MUTE indicator light goes out.
   - The unit will return to the standby mode.

You can use the following features while the dialing buttons are locked.

- Dialing a number you programmed into the memory of the EMERGENCY button.

- Adjusting the handset and speakerphone volumes.

- Muting the conversation.

- Answering the second call by pressing FLASH.

4.4.2. To Cancel the Dial Lock

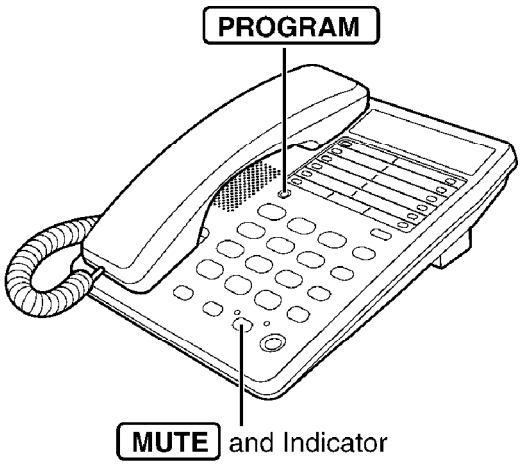
Follow steps 1 through 3 above again.

4.5. Call Restriction

You can prevent the unit from dialing phone numbers beginning with specified digit(s) (1 digit or 2 digits). Phone numbers with the restricted leading digits cannot be dialed out.

4.5.1. To Set the Call Restriction

Make sure that a call is not put on hold.



1 Press [PROGRAM].
- The MUTE indicator flashes.

2 Press [MUTE].

3 Press [1].
- If you use "1111" as a PIN code (factory set), there is no need to enter a PIN code. Go to step 6.

4 Enter the PIN code .

5 Press [PROGRAM].
- If a wrong PIN code is entered, 3 beeps will sound. Enter a correct PIN code and press [PROGRAM].

6 Enter the number(s) (1 digit or 2 digits) you want to restrict ([0] to [9]).
- If you enter a wrong number, enter a correct number.
- To change restricted digits from 2 digits to 1 digit, press [*] and enter 1 digit.

7 Press [PROGRAM].
- A long beep sounds.
- The MUTE indicator light goes out.
- The unit will return to the standby mode.

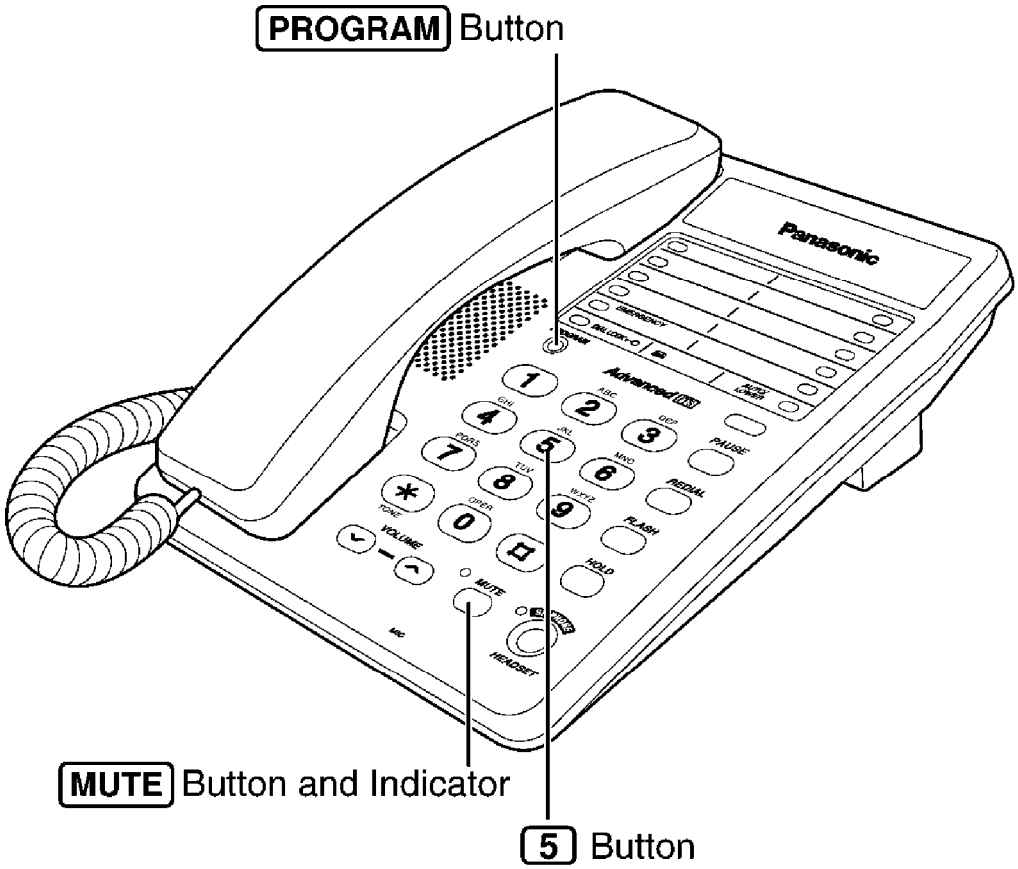
- If your unit is connected to a PBX, this function may not operate. Contact your PBX supplier for more information.

4.6. To cancel the call restriction

Follow steps 1 through 5. In step 6, press [*] to cancel call restriction and press [PROGRAM].

- A long beep will sound and the unit will return to the standby mode.

4.7. How to Release the Establishment of Dial Lock



After this procedure, you will be able to establish a new password.
How to release the establishment of dial lock.

1. Press **PROGRAM** . → **MUTE LED Flashing.**

2. Press **MUTE** .

3. Press **5** .

4. Enter "10349276" for initialling of password.

5. Press **PROGRAM** .

6. Enter a new password 4 digits code
   by dial key pad (ex. "1234").

7. Press **PROGRAM** . → **MUTE LED OFF.**

After this procedure, the password for
"DIAL LOCK" will be returned to "1 2 3 4".

8. To cancel the Dial Lock,
   follow **4.4.2. To Cancel the Dial Lock**.

5. DISASSEMBLY INSTRUCTIONS

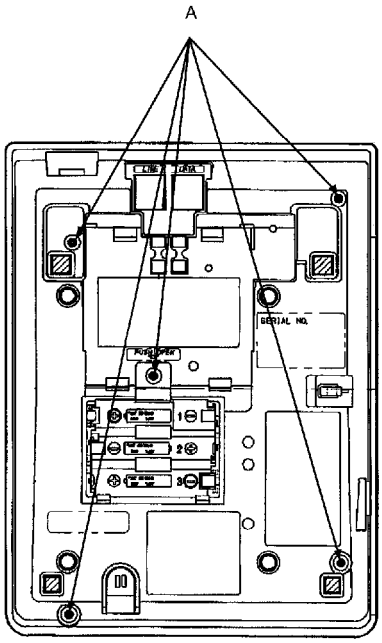


Fig 1

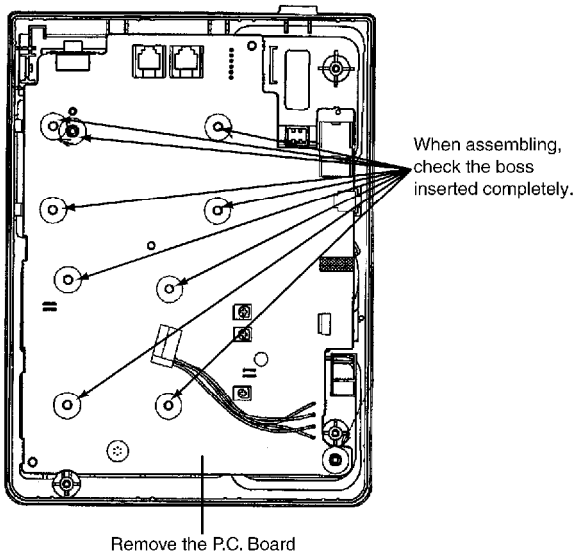


Fig 2

Ref. No.	Procedure	Shown in Fig —.	To remove —.	Remove —.
1	1	1	Lower Cabinet	Screws (2.6×12) . . . . . (A
2	1 ~ 2	2	Printed Circuit Board	Remove the P.C.Board

6. HOW TO REPLACE FLAT PACKAGE IC

6.1. Preparation

- SOLDER

Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

Recommended power consumption will be between 30 W to 40 W.
Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
(An expert may handle between 60 ~ 80 W iron, but beginner might damage foil by overheating.)

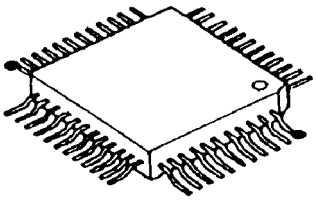
- Flux

HI115 Specific gravity 0.863
(Original flux will be replaced daily.)

6.2. Procedure

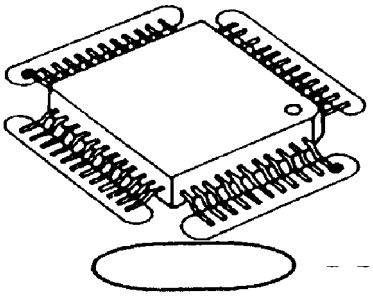
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.
***Most important matter is accurate setting of IC to the**

corresponding soldering foil.

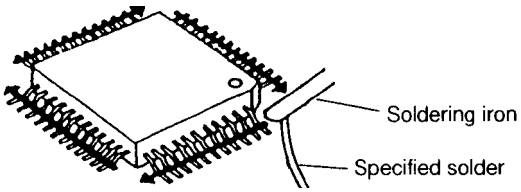


● - - - - - - Temporary soldering point.

2. Apply flux for all pins of FLAT PACKAGE IC.

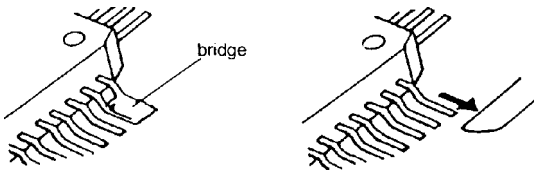


3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.



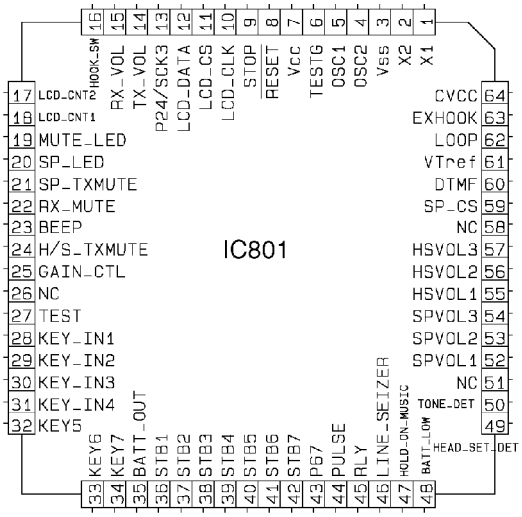
6.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.



7. CPU DATA

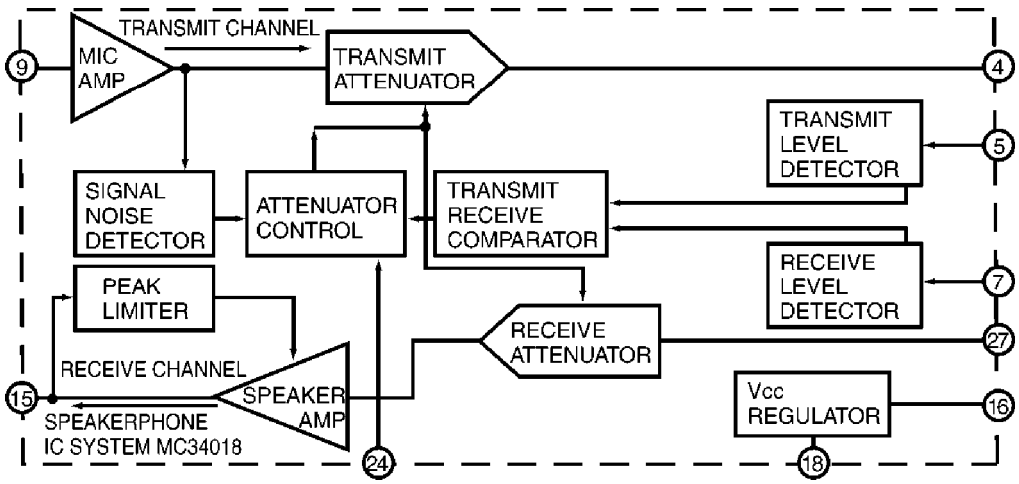
7.1. IC801



Pin	Description	I/O	High	Hi-z	Low
1	X1	-	Active	-	Active
2	X2	-	Active	-	Active
3	GND	-	-	-	Fixed
4	OSC2	-	Active	-	Active
5	OSC1	-	Active	-	Active
6	TEST terminal	-	-	-	Fixed
7	Power supply	-	Fixed	-	-
8	RESET	D.I	Normal	-	Reset
9	STOP Input	D.I	Normal	-	Stop
10	LCD_CLK	D.O	Active	-	Active
11	LCD_CS	D.O	Normal	-	Active
12	LCD_DATA	D.O	DATA	-	DATA
13	NC	D.I	-	-	Fixed
14	TX_VOL_DOWN	D.O	-	Normal	Vol Down
15	RX_VOL_DOWN	D.O	-	Normal	Vol Down
16	HOOK_SW	D.I	On-Hook	-	Off-Hook
17	LCD_CNT2	D.O	Bright	-	Dark
18	LCD_CNT1	D.O	Bright	-	Dark
19	MUTE_LED	D.O	-	OFF	ON
20	SP_LED	D.O	-	OFF	ON
21	SP_TXMUTE	D.O	Mute	-	Unmute
22	RXMUTE	D.O	Mute	-	Unmute
23	BEEP OUTPUT	D.O	Active	-	Active
24	HS_TXMUTE	D.O	Mute	-	Unmute
25	GAIN_CTL	D.O	Handset	-	Headset
26	NC	D.O	-	-	Fixed
27	TEST_MODE	D.I	Normal	-	TEST_MODE
28	Key In	D.I	Non Active	-	Active
29	Key In	D.I	Non Active	-	Active
30	Key In	D.I	Non Active	-	Active
31	Key In	D.I	Non Active	-	Active
32	Key In	D.I	Non Active	-	Active

Pin	Description	I/O	High	Hi-z	Low
33	Key In	D.I	Non Active	-	Active
34	Key In	D.I	Non Active	-	Active
35	BATT.OUT	D.I	Battery provided	-	None
36	Strobe	D.O	-	Non Active	Active
37	Strobe	D.O	-	Non Active	Active
38	Strobe	D.O	-	Non Active	Active
39	Strobe	D.O	-	Non Active	Active
40	Strobe	D.O	-	Non Active	Active
41	Strobe	D.O	-	Non Active	Active
42	Strobe	D.O	-	Non Active	Active
43	Strobe	D.O	-	Non Active	Active
44	PULSE	D.O	Break	-	Make
45	RLY	D.O	ON	-	OFF
46	L_SEZ/P_MUT	D.O	ON	-	OFF
47	HOLD_MUSIC	D.O	Music output	-	Music stop
48	BATT.LOW	D.I	NORMAL	-	BATT.LOW
49	HEAD_DET	D.I	Headset on	-	Headset off
50	TONE_DET	D.I	None	-	Tone
51	NC	D.O	-	-	Fixed
52	SP_VOL1	D.O	-	High	Low
53	SP_VOL2	D.O	-	High	Low
54	SP_VOL3	D.O	-	High	Low
55	HS_VOL1	D.O	Low	-	Hi
56	HS_VOL2	D.O	Low	-	Hi
57	HS_VOL3	D.O	Low	-	Hi
58	NC	D.O	-	-	Fixed
59	SP_CS	D.O	Off	-	On
60	DTMF	D.O	Active	-	Active
61	Vtref	D.O	-	-	-
62	Loop	A.I	-	-	-
63	EX_HOOK	D.I	ON->OFF HOOK	-	Normal
64	CVCC	D.O	-	-	-

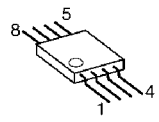
7.2. Speakerphone IC Data



Pin NO.	Name	Description
1	RR	A resistor to ground provides a reference current for the transmit and receive attenuato
2	RTX	A resistor to ground determines the nominal gain of the transmit attenuator. The transm channel gain is inversely proportional to the RTX resistance.
3	TXI	Input to the transmit attenuator. Input resistance is nominally 5.0 kohms.
4	TXO	Output to the transmit attenuator. The TXO output signal drives the input of the transmi detector, as well as the external circuit which drives the telephone line.
5	TLI	Input of the transmit level detector. An external resistor ac coupled to the TLI pin sets th detection level. Decreasing this resistor increases the sensitivity to transmit channel sig
6	TLO	Output of the transmit level detector. An external resistor and capacitor set the time the comparator will hold the system in the transmit mode after speech ceases.
7	RLI	Input of the receive level detector. An external resistor ac coupled to the RLI pin sets the detection level. Decreasing this resistor increases the sensitivity to receive channel sig
8	RLO	Output of the receive level detector. An external resistor and capacitor set the time the comparator will hold the system in the receive mode after the receive signal ceases.
9	MCI	Microphone amplifier input. Input impedance is nominally 10 kohms and the dc bias volt approximately equal to VB.
10	MCO	Microphone amplifier output. The mic amp gain is internally set at 34 dB (50 V/V).
11	CP1	A parallel resistor and capacitor connected between this pin and Vcc holds a voltage corresponding to the background noise level. The transmit detector compares the CP1 with the speech signal from CP2.
12	CP2	A capacitor at this pin peak detects the speech signals for comparison with the backgro noise level held at CP1.
13	XDI	Input to the transmit detector system. The microphone amplifier output is ac coupled to pin through an external resistor.
14	SKG	High current ground pin for the speaker amp output stage. The SKG voltage should be mV of the ground voltage at pin 22.
15	SKO	Speaker amplifier output. The SKO pin will source and sink up to 100 mA when ac coupl speaker. The speaker amp gain is internally set at 34 dB (50 V/V).
16	V+	Input dc supply voltage. V+ can be powered from Tip and Ring if an ac decoupling induc used to prevent loading ac line signals. The required V+ voltage is 6.0 to 11 V (7.5 V nom 7.0 mA.
17	AGC	A capacitor from this pin to VB stabilizes the speaker amp gain control loop, and additio controls the attack and decay time of this circuit. The gain control loop limits the speak input to prevent clipping at SKO. The internal resistance at the AGC pin is nominally 11(
18	CS	Digital chip select input. When at a Logic "0" (<0.7 V) the Vcc regulator is enabled. Wher Logic "1" (>1.6 V), the chip is in the standby mode drawing 0.5 mA. An open CS pin is a l Input impedance is nominally 140 kohms. The input voltage should not exceed 11 V.
19	SKI	Input to the speaker amplifier. Input impedance is nominally 20 kohms.
20	Vcc	A 5.4 V regulated output which powers all circuit expect the speaker amplifier output sta can be used to power external circuitry such as a microprocessor (3.0 mA max). A filter is required. The MC 34018 can be powered by a separate regulated supply by connectin Vcc to a voltage between 4.5 V and 6.5 V while maintaining CS at a Logic "1".
21	VB	An output voltage equal to approximately Vcc/2 which serves as an analogue ground fo speakerphone system. Up to 1.5 mA of external load current may be sourced from VB. C impedance is 250 ohms. A filter capacitor is required.

Pin NO.	Name	Description
22	Gnd	Ground pin for the IC (except the speaker amplifier).
23	XDC	Transmit detector output. A resistor and capacitor at this pin hold the system in the tran mode during pauses between words or phrases. When the XDC pin voltage decays to g the attenuators switch from the transmit mode to the idle mode. The internal resistor at nominally 2.6 kohms.
24	VLC	Volume control input. Connecting this pin to the slider of a variable resistor provides re mode volume control. The VLC pin voltage should be less than or equal to VB.
25	ACF	Attenuator control filter. A capacitor connected to this pin reduces noise transients as t attenuator control switches levels of attenuation.
26	RXO	Output of the receive attenuator. Normally this pin is ac coupled to the input of the spea amplifier.
27	RXI	Input of the receive attenuator. Input resistance is nominally 5.0 kohms.
28	RRX	A resistor to ground determines the nominal gain of the receive attenuator. The receive gain is directly proportional to the RRX resistance.

8. TERMINAL GUIDE OF IC'S TRANSISTORS AND DIODES

<table>
<tr>
<td> 

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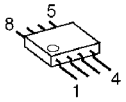
<td> 

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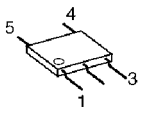
<td> 

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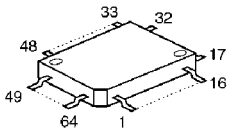
<td> 

C2CBFE000007</td>
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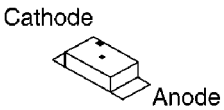
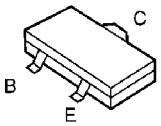
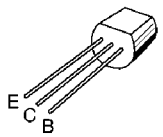
<td> 

PQVDSML210LT</td>
<td colspan="2"> 

PQVTD143Z106,2SD1819A
UN5213,2SK1399,PQVTFB1J3P
2SB1218A</td>
<td> 

PQVT2N6517CA
2SA1625
2SC2120</td>
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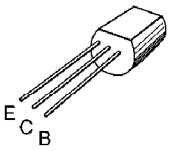
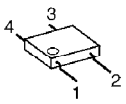
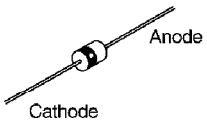
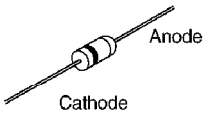
<td> 

PQVIUM66T11L</td>
<td> 

PQVIBA8205F</td>
<td> 

1SS119</td>
<td> 

MA4300</td>
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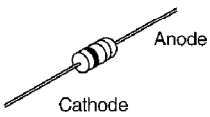
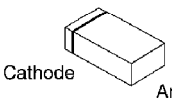
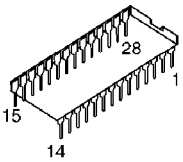
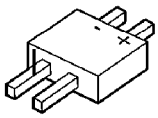
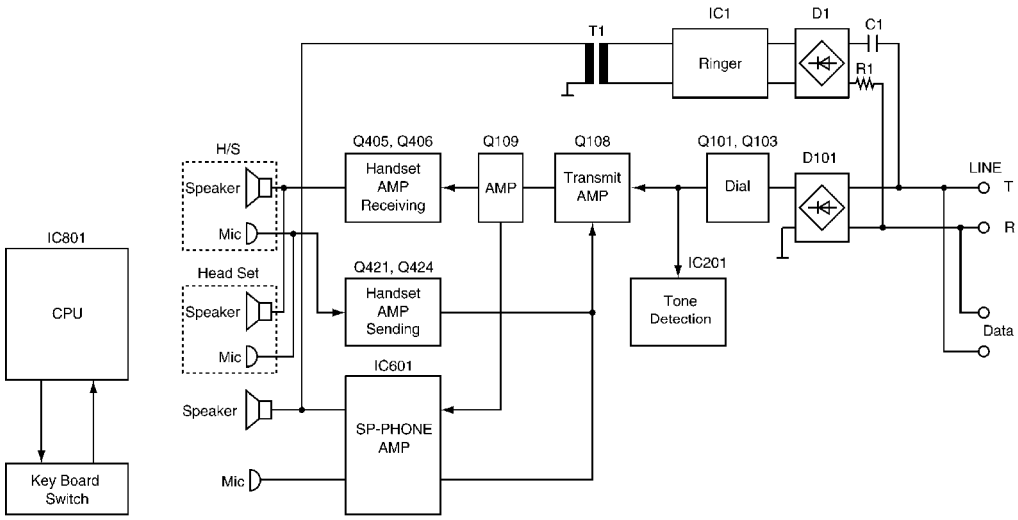
<td> 

MA4180
MA4056,MA4062</td>
<td> 

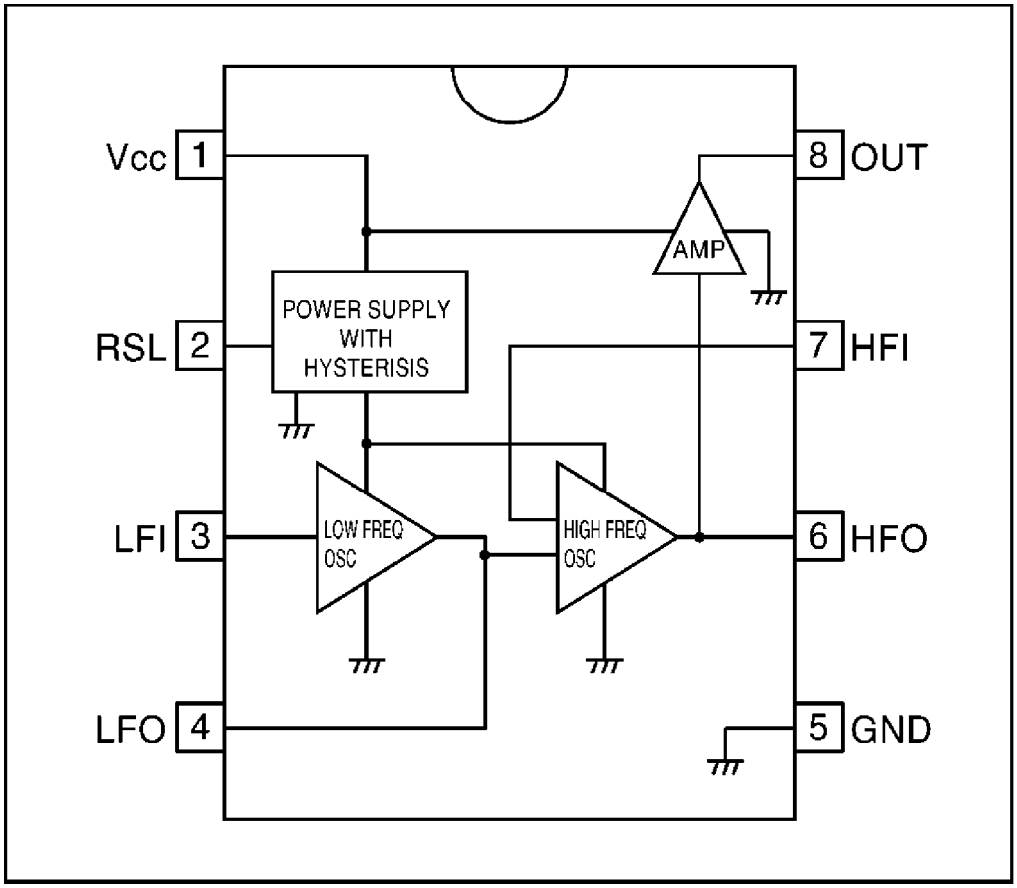
MA111</td>
<td> 

PQVISC77655S</td>
<td> 
PQVDS1ZB60F1</td>
</tr>
</table>

9. BLOCK DIAGRAM



10. BLOCK DIAGRAM (IC 1)



10.1. Communication ICs

Pin descriptions

Pin No.	Pin name	Name	Function
1	Vcc	Power supply pin	This is the power supply pin for the IC. It is connected to the (⊕) pin of the diode bridge.
2	RSL	RSL pin	This is used to change the operation initiation current when connected to the GND pin.
3	LFI	Low-frequency time constant connector pin	This is connected to the time constant that determines the oscillation frequency on the warble.
4	LFO		
5	GND	GND pin	This pin has the lowest potential on the IC. It is connected to the (⊖) pin of the diode bridge
6	HFO	High-frequency time constant connector pin	This is connected to the time constant that determines the oscillation frequency on the tone side (the audible frequency side).
7	HFI		
8	OUT	Output pin	This is used to connect a piezoelectric buzzer, or to connect a dynamic speaker through a transformer.

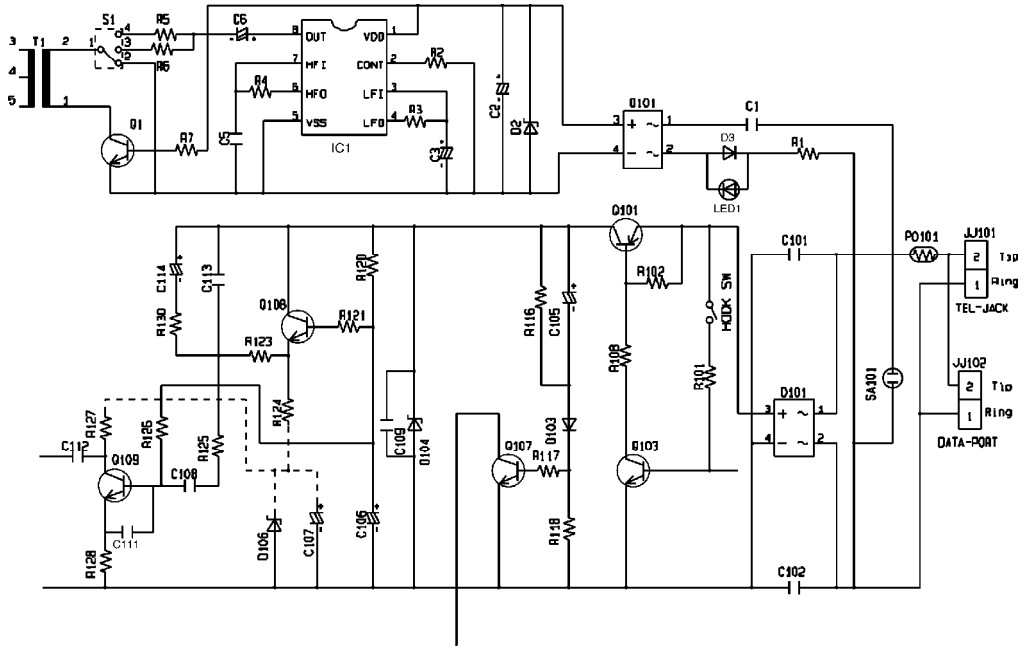
11. CIRCUIT OPERATION

11.1. Bell Detector Circuit

When the bell signal is input between T/R, the signal are outputted at the speaker via the following path: Tel line → R1/C1 → D1 → Pin 1 of IC1 → Pin 8 of IC1 → C6 → T1 → C625 → Speaker

11.2. Line Interface

In talk status, L1 RLY output from pin 25 of IC801 changes to low level, causing Q103, Q101 to turn on and resulting in a line loop.The loop current flows from D101(+) → Q101 → Q108 → R124 → D106 in that order, A pulse signal that repeated switches between high and low logic is output from pin 26 of the CPU.This switches the line loop on and off, generating the dial pulse signal.



11.3. MODULE BLOCK DIAGRAM

11.3.1. Speakerphone Circuit

11.3.1.1. Function

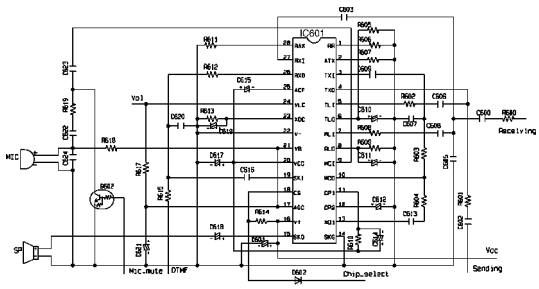
The circuit controls the automatic switching of the transmitted and received signals, to and from the telephone line, when the unit is used in the hands -free mode.

11.3.1.2. Circuit Operation

The speakerphone can only provide a one-way communication path.
In other words, it can either transmit an outgoing signal or receive an incoming signal at a given time, but cannot do both simultaneously. Therefore, a switching circuit is necessary to control the flow of the outgoing and incoming signals.
This switching circuit is contained in IC601 and consists of a Voice Detector, TX Attenuator, RX Attenuator, Comparator and Attenuator Control. The circuit analyzes whether the TX(transmit) or the RX(receive) signal is louder, and then it processed the signals such that the louder signal is given precedence.
The Voice Detector provides a DC input to the Attenuator Control corresponding to the TX signal.
The Comparator receives a TX and a RX signal, and supplies a DC input to the Attenuator Control corresponding to the RX signal.
The Attenuator Control provides a control signal to the TX and the RX attenuator to switch the appropriate signals on and off. The Attenuator Control also detects the level of the volume

control to automatically adjust for changing ambient conditions.

1. **Transmission signal path:**
   The input signal from the microphone is sent through the circuit via the following path:MIC → Pin 9 of IC601 → Pin 10 of IC601 → Pin 3 of IC601 → Pin 4 of IC601 → R601 → C602 → Q108 → Tel line.
2. **Reception signal path:**
   Signals receive from the telephone line are outputted at the speaker via the following path:Tel line → Q108 → Q109 → C112 → R600 → C603 → Pin 27 of IC601 → Pin 26 of IC601 → Pin 19 of IC601 → Pin 15 of IC601 → Speaker.
3. **Transmission/Reception switching**
   The comparison result between TX and RX outputs as a DC level of Pin 25 of IC601.TX level is high ..... Pin 25 = Pin 21 - 6mVRX level is high ..... Pin 25 = Pin 21 - 150mVComparator output is connected to the attenuator control inside of IC601.
4. **Voice detector**
   The output of the mic amp (Pin 10 of IC601) is supplied to Pin 13 of IC601 as a control signal for the voice detector.
5. **Attenuator control**
   The attenuator control detects the setting of the volume control through Pin 24 of IC601 to automatically adjust for changing ambient conditions.



11.3.2. Telephone Line Interface

11.3.2.1. Circuit operation

- On hook

Q101 is open, Q101 is connected as to cut DC loop current and cut the voice signal.

- Off hook

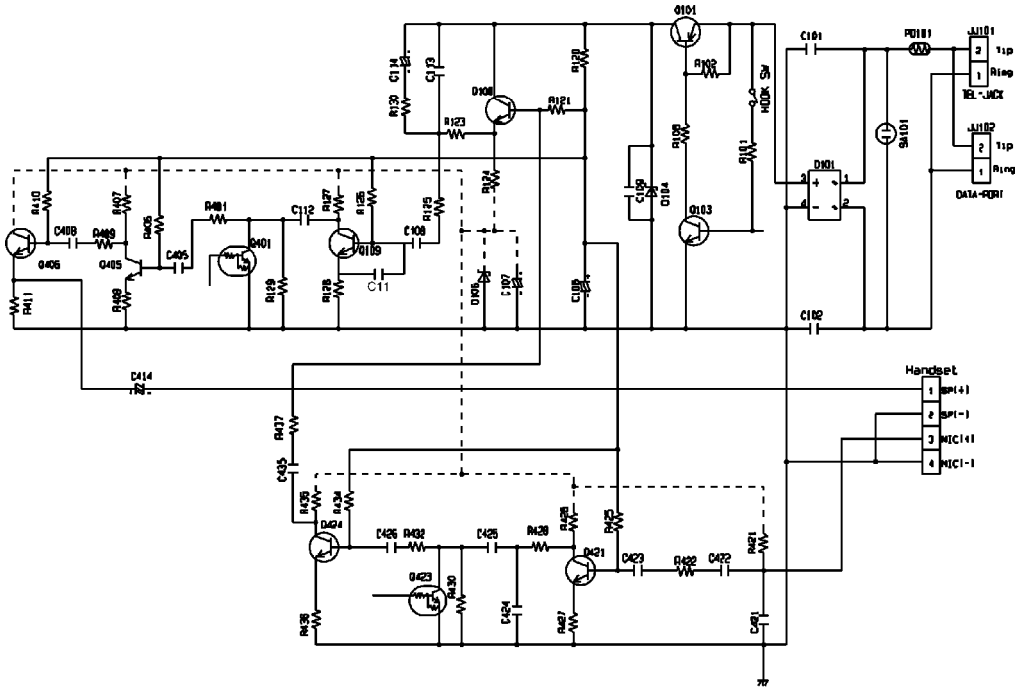
Q101 turns on thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow id for the DC loop current. T → POS101 → D101 → Q101 → Q108 → R124 → D106 → D101 → R

- The receiving signal flows:

TEL line → POS101 → Q101 → C113 → R125 → C108 → Q109 → Q405 → Q406 → Speaker

- The transmission signal flows

Mic → Q421 → Q424 → C435 → R437 → Q108 → POS101 → Tel Line



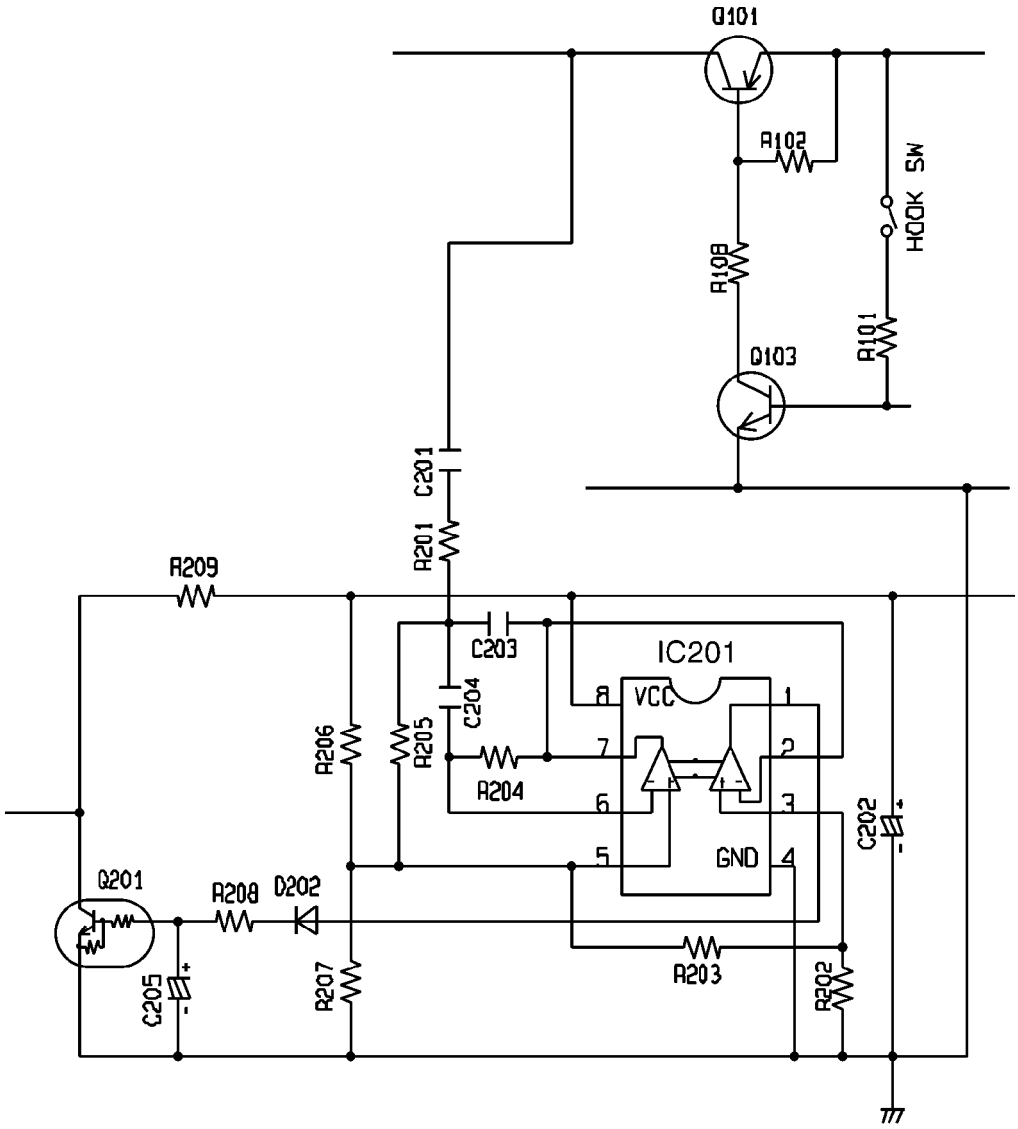
11.3.3. Tone Detect

This circuit is used to sense the status of the line (busy tone or dial tone) during Auto Redial.

11.3.3.1. Circuit operation

D101 → Q101 → C201 → R201 → R205 → Pin 5 of IC201 → Pin 1 of IC201 → D202 → R208 → Q201

When the subscriber hangs-up, check the intermittent tone. If cycle tone is detected, the collector of Q201 goes to a low logic.



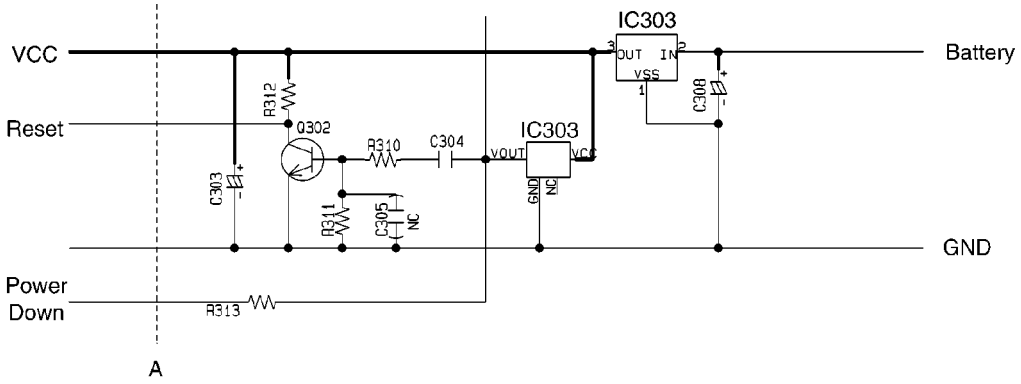
11.3.4. Inializing Circuit

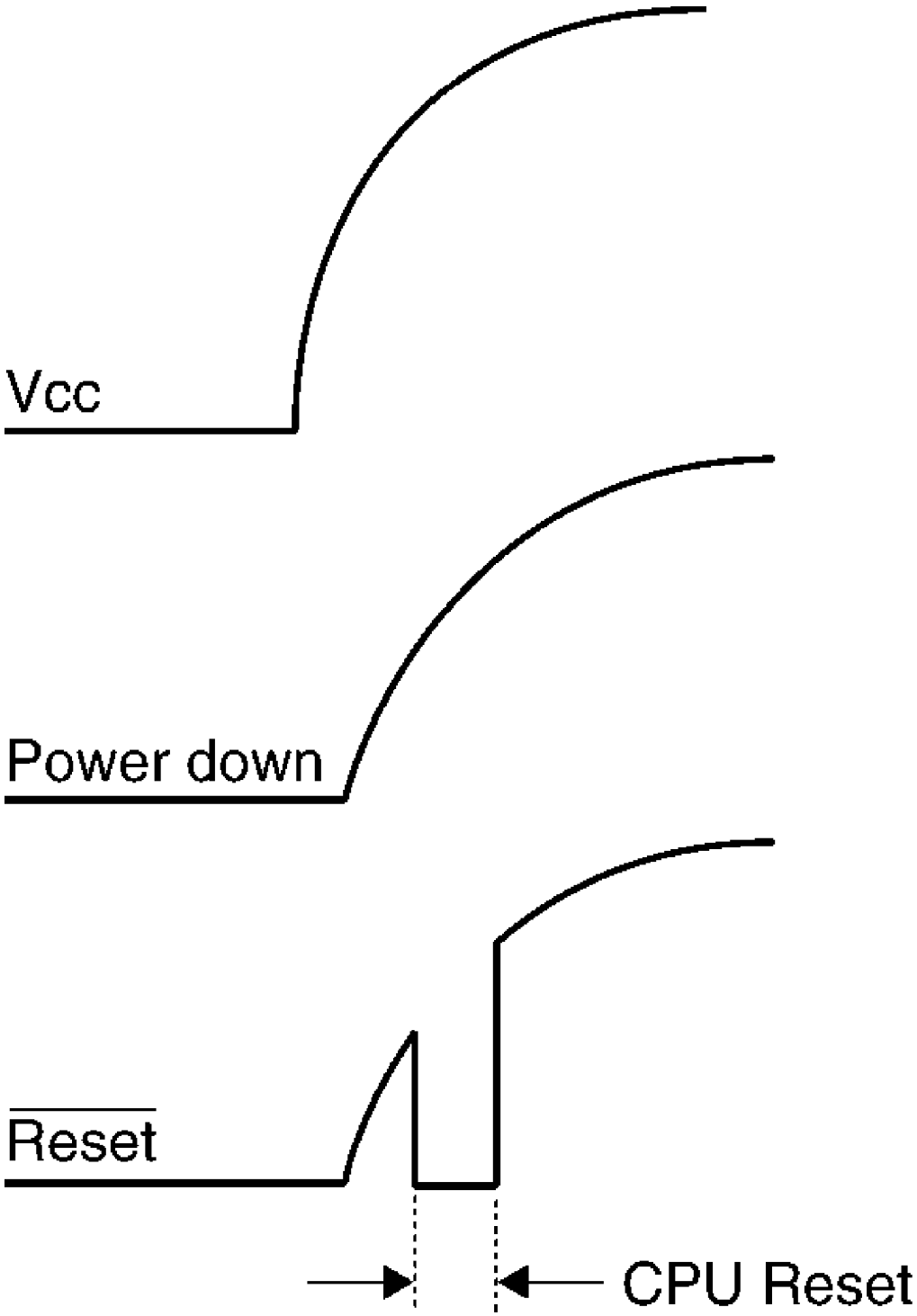
11.3.4.1. Function

This circuit is used for to initialize the microcomputer when it incorporates batteries.

11.3.4.2. Circuit operation

When the batteries is inserted into the unit, then the voltage is shifted by D304 and power is supplied to the CPU. The set can operate beyond point A in the circuit voltage diagram.


VCC
Reset
Power
Down
A
R312
Q302
R310
C304
C303
R311
C305
NC
R313
IC303
OUT
IN
VSS
C308
IC303
VOUT
VCC
GND
NC
Battery
GND

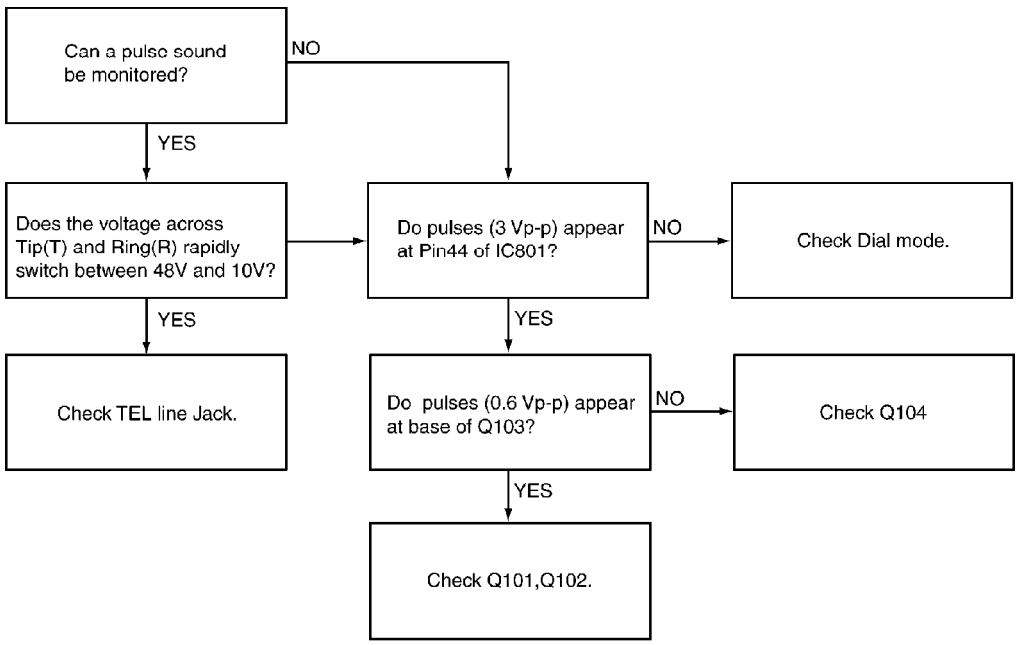


12. TROUBLE SHOOTING GUIDE

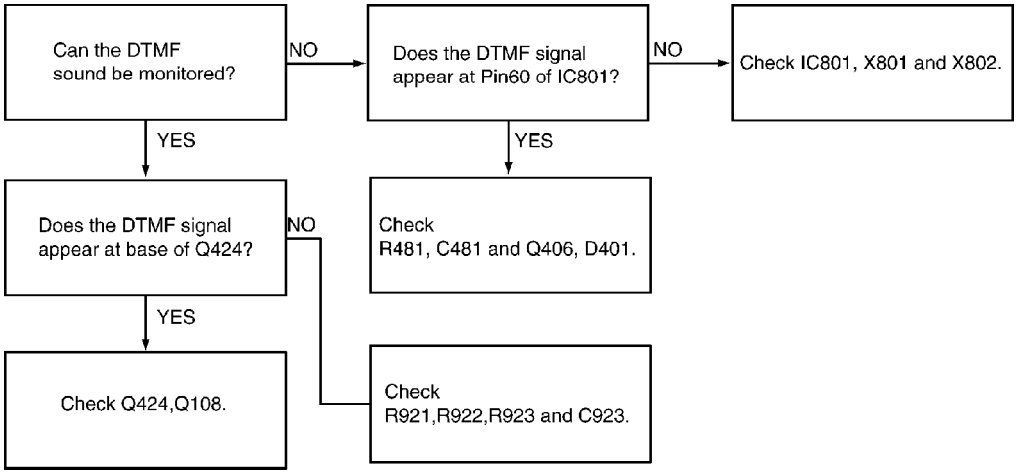
12.1. Service Hints

SYMPTOM	CURE
Dead	Check IC801, X801, X802
Can't hear the voice from handset.	Check Q109, Q405, Q406.
No voice transmit.	Check Q421, Q424, Q108.
Can't tone dial.	Check IC801, R921, R922, R923 and C923.
Can't pulse dial	Check Q101, Q103, Q104.
Can't auto redial	Check IC201, Q201.
No rings.	Check D1, IC1 and Q1.
can't speak with the speakerphone.	Check IC601.
Can't hold.	Check Q107.
Can't speak with the handset.	Check handset jack
Can't speak with the headset.	Check headset jack
Can't change the volume for speakerphone.	Check IC801, IC601
Can't change the volume for handset.	Check IC801, Q405
No volume handset or speakerphone.	Check IC801, Q108, Q401.

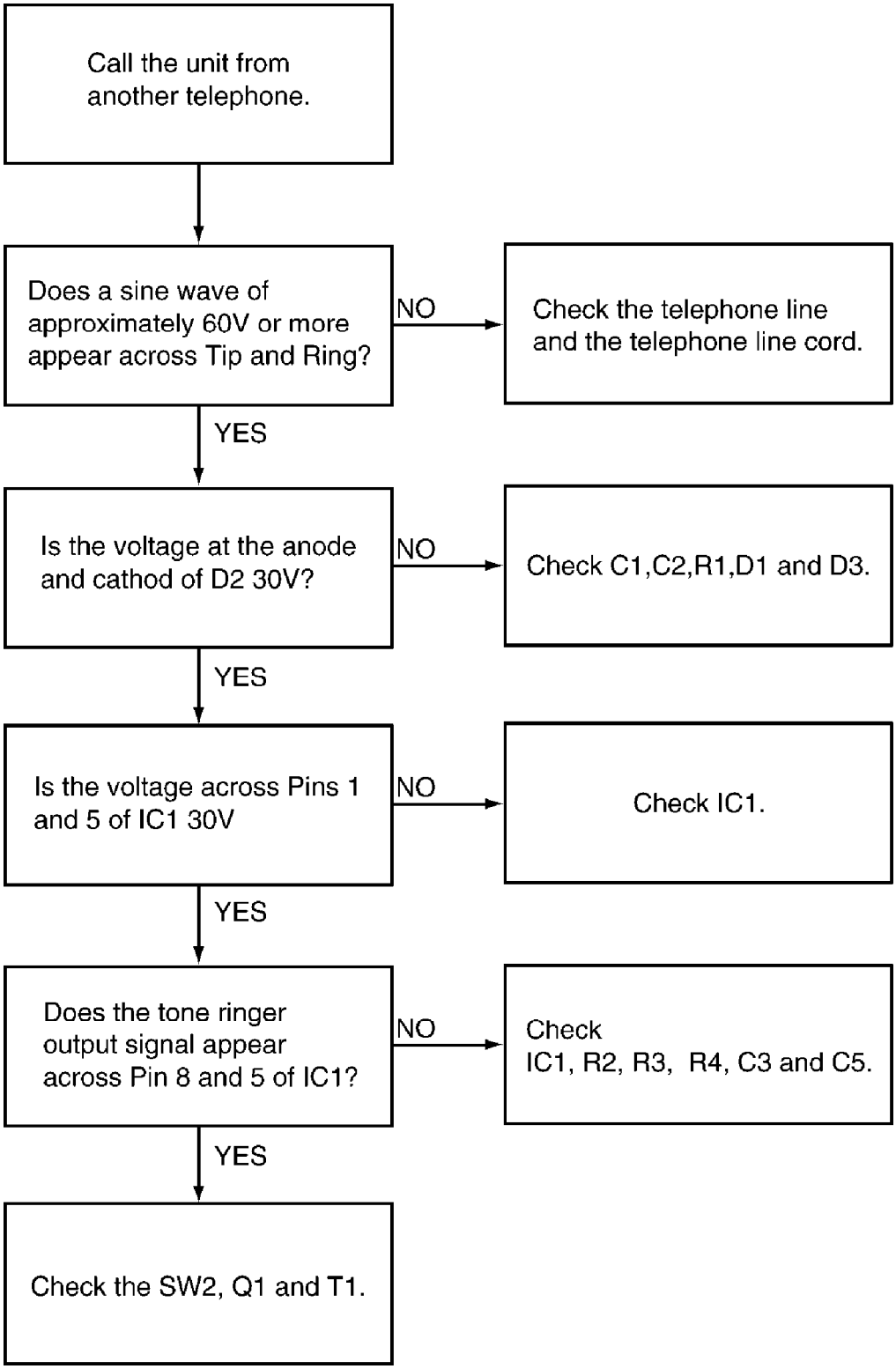
12.2. Pulse Dialing Problems



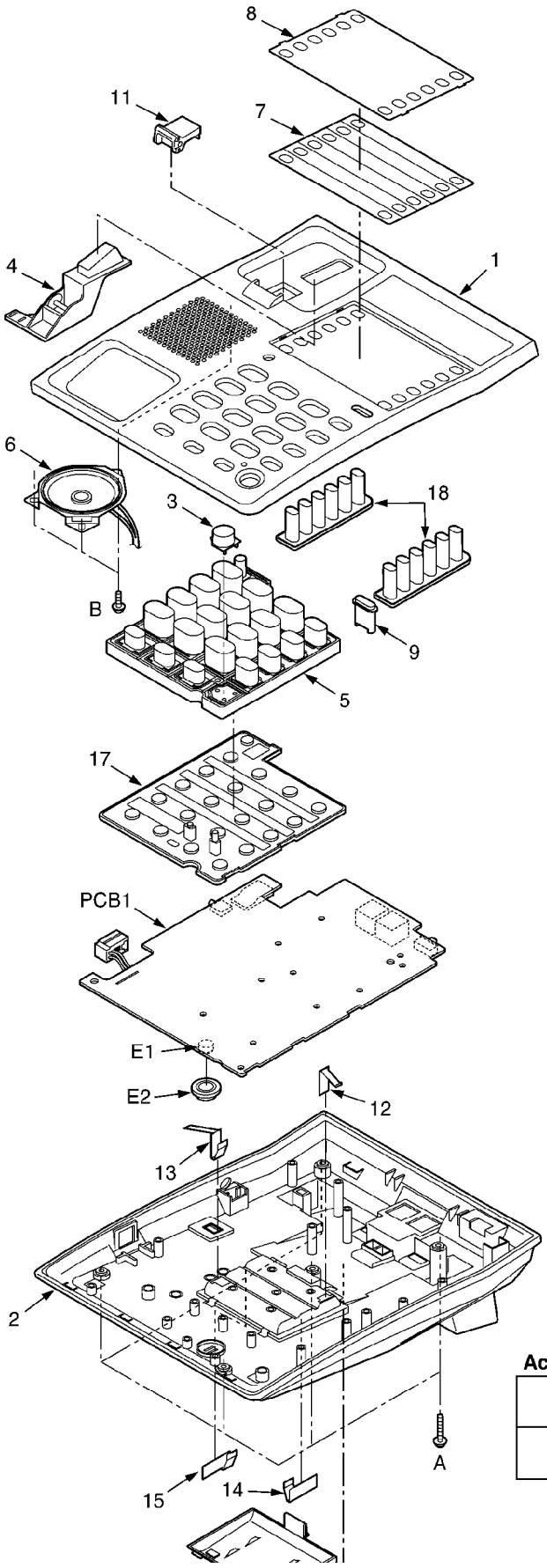
12.3. Tone Dialing Problems (Hnadset)



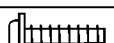
12.4. No Ringing Sound When Ring Signal is Input.

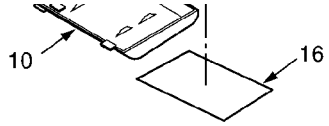

Call the unit from another telephone.
Does a sine wave of approximately 60V or more appear across Tip and Ring?
NO
Check the telephone line and the telephone line cord.
YES
Is the voltage at the anode and cathod of D2 30V?
NO
Check C1,C2,R1,D1 and D3.
YES
Is the voltage across Pins 1 and 5 of IC1 30V
NO
Check IC1.
YES
Does the tone ringer output signal appear across Pin 8 and 5 of IC1?
NO
Check IC1, R2, R3, R4, C3 and C5.
YES
Check the SW2, Q1 and T1.

13. CABINET AND ELECTRICAL PARTS LOCATION

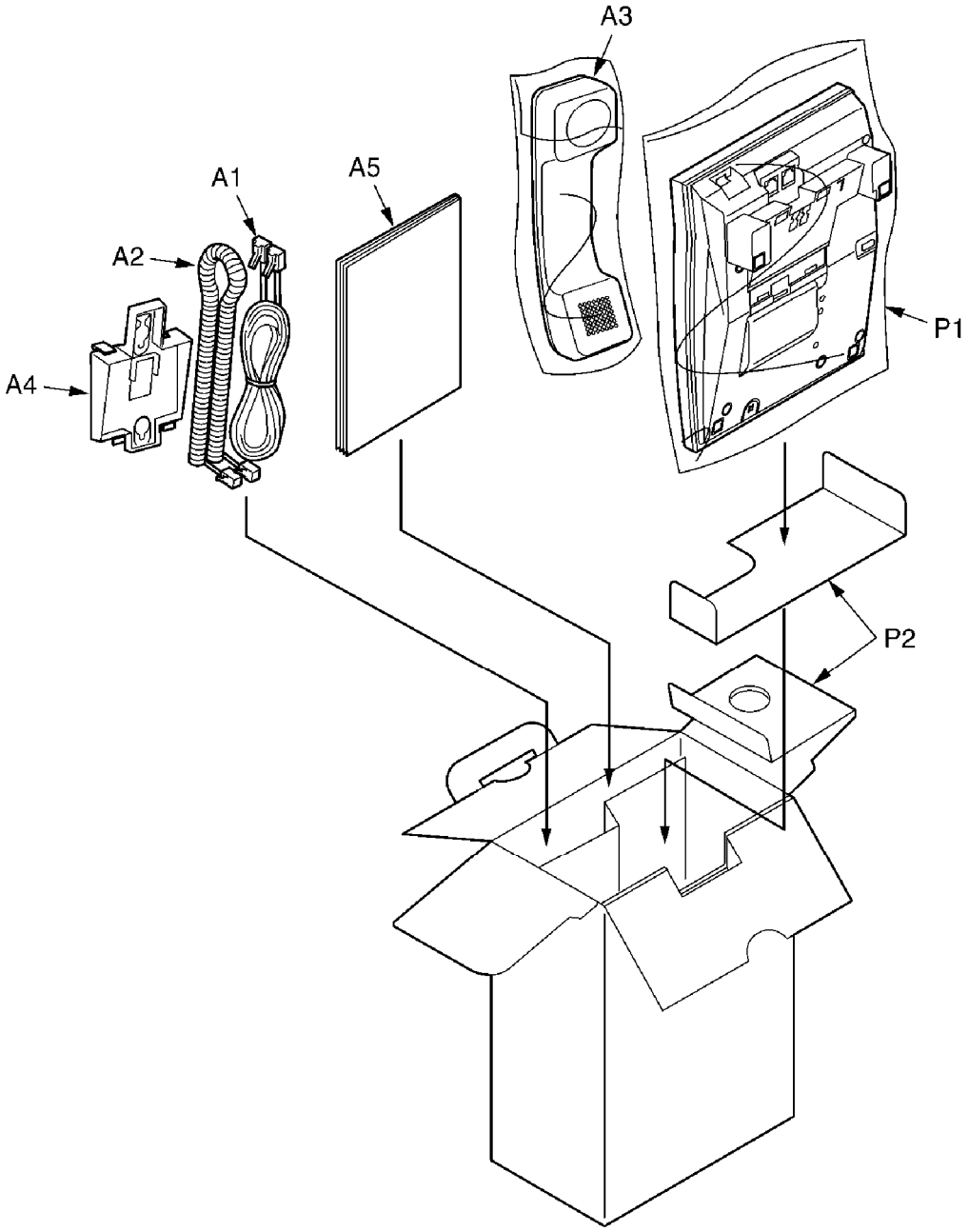


Actual Size of Screws

A	XTW26+12P	
B	XTW26+8P	



14. ACCESSORY AND PACKING MATERIALS



15. REPLACEMENT PARTS LIST

This replacement parts list is KX-TS105LXW only.

1. RTL (Retention Time Limited)

Note:
The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability depends on the type of assembly and the laws governing parts and product retention. At the end of this period, the assembly will no longer be available.

2. Important safety notice
Components identified by the ⚠ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS
Unless otherwise specified;
All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
All capacitors are in MICRO FARADS (μ F)P= μ μ F
***Type & Wattage of Resistor**

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

15.1. Base Unit

15.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQKM10503W1	UPPER CABINET	S
2	PQYF10525Y1	LOWER CABINET	S
3	PQBC10347Z2	BUTTON	S
4	PQBH10034Z1	BUTTON	S
5	PQBX10348Z1	BUTTON	S
6	PQAS57P03Z	SPEAKER	
7	PQGD10162Z	TELEPHONE CARD	
8	PQGV10039Z	TELEPHONE CARD COVER	
9	PQHR10875Z	COVER	
10	PQKK10105Z1	BATTERY COVER	S
11	PQKE10070Z3	HANGER	S
12	PQJC10044Z	BATTERY TERMINAL	
13	PQJC10045Z	BATTERY TERMINAL	
14	PQJC313Z	BATTERY TERMINAL	
15	PQJC314Z	BATTERY TERMINAL	
16	PQGT14834Z	NAME LABEL	
17	PQSX10186Z	KEYBOARD SWITCH	
18	PQSX10187Z	KEYBOARD SWITCH	

15.1.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPT2373MXW	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC1	PQVIBA8206F	IC	S
IC201	PQVINJM2904F	IC	S
IC303	PQVIPS3327UT	IC	
IC304	PQVIXCF3702P	IC	
IC601	PQVISC77655S	IC	S
IC801	C2CBFE000007	IC	
IC903	PQVIUM66T11L	IC	S
		(TRANSISTORS)	
Q1	2SD1819A	TRANSISTOR(SI)	
Q101	2SA1625	TRANSISTOR(SI)	S
Q103	PQVT2N6517CA	TRANSISTOR(SI)	S
Q104	2SK1398	TRANSISTOR(SI)	S
Q107	2SD1819A	TRANSISTOR(SI)	
Q108	2SC2120	TRANSISTOR(SI)	S
Q109	2SD1819A	TRANSISTOR(SI)	
Q201	UN5213	TRANSISTOR(SI)	S
Q302	2SD1819A	TRANSISTOR(SI)	
Q303	2SB1218A	TRANSISTOR(SI)	
Q401	PQVTFB1J3P	TRANSISTOR(SI)	S
Q405	2SD1819A	TRANSISTOR(SI)	
Q406	2SD1819A	TRANSISTOR(SI)	
Q421	2SD1819A	TRANSISTOR(SI)	
Q423	PQVTFB1A4M	TRANSISTOR(SI)	S
Q424	2SD1819A	TRANSISTOR(SI)	
Q425	2SD1819A	TRANSISTOR(SI)	
Q426	2SD1819A	TRANSISTOR(SI)	
Q491	UN5213	TRANSISTOR(SI)	S
Q492	UN5213	TRANSISTOR(SI)	S
Q493	UN5213	TRANSISTOR(SI)	S

Ref. No.	Part No.	Part Name & Description	Remarks
Q602	UN5213	TRANSISTOR(SI)	S
		(DIODES)	
D1	PQVDS1ZB60F1	DIODE(SI)	S
D2	MA4300	DIODE(SI)	
D3	1SS119	DIODE(SI)	S
D101	PQVDS1YB60F1	DIODE(SI)	S
D102	MA111	DIODE(SI)	
D103	MA111	DIODE(SI)	
D104	MA4180	DIODE(SI)	
D105	1SS119	DIODE(SI)	S
D106	MA4062	DIODE(SI)	
D202	MA111	DIODE(SI)	
D203	MA111	DIODE(SI)	
D301	MA111	DIODE(SI)	
D302	1SS119	DIODE(SI)	S
D304	1SS119	DIODE(SI)	S
D305	MA111	DIODE(SI)	
D308	1SS119	DIODE(SI)	S
D401	MA111	DIODE(SI)	
D601	1SS119	DIODE(SI)	S
D602	MA111	DIODE(SI)	
LED1	PSVD1SRCT	LED	S
LED801	PSVD1SRCT	LED	S
LED802	PSVD1SRCT	LED	S
		(SWITCHES)	
S1	PQSS3A17W	SWITCH	
PQSX01	PQSX10186Z	SWITCH	
PQSX02	PQSX10187Z	SWITCH	
PQSX03	PQSX10187Z	SWITCH	
SW101	PQSH2B105Z	SWITCH	
		(JACKS)	
JJ101	PQJJ1T020Z	JACK	
JJ102	PQJJ1T020Z	JACK	
Handse	PQJJ1T030Z	JACK	
CN401	PQJJ1C001Z	JACK	S
		(VARISTOR)	
SA101	PQVDDSS301L	VARISTOR	⚠S
		(CRYSTAL OSCILLATORS)	
X801	PQVBCST80MG6	CRYSTAL OSCILLATOR	S
X802	PFVCCFS32Z	CRYSTAL OSCILLATOR	
		(TRANSFORMER)	
T1	PQLT2D2A	TRANSFORMER	S
		(RESITORS)	
R1	ERDS1TJ682	6.8k	S
R2	ERJ3GEYJ183	18k	
R3	ERJ3GEYJ334	330k	
R4	ERJ3GEYJ124	120k	
R5	ERJ3GEY0R00	0	
R6	ERJ3GEYJ103	10k	
R7	ERJ3GEYJ473	47k	
R101	ERDS2TJ563	56k	
R102	ERJ3GEYJ104	100k	
R103	ERJ3GEYJ104	100k	
R104	ERJ3GEYJ473	47k	

Ref. No.	Part No.	Part Name & Description	Remarks
R105	ERJ3GEYJ684	680k	
R107	ERJ3GEYJ474	470k	
R108	ERDS2TJ472	4.7k	
R116	ERJ3GEYJ473	47k	
R117	ERJ3GEYJ682	6.8k	
R118	ERJ3GEYJ103	10k	
R119	ERJ3GEYJ104	100k	
R120	ERJ3GEYJ122	1.2k	
R121	ERJ3GEYJ103	10k	
R123	ERJ3GEYJ330	33	
R124	ERDS1TJ150	15	S
R125	ERJ3GEYJ472	4.7k	
R126	ERJ3GEYJ335	3.3M	
R127	ERJ3GEYJ472	4.7k	
R128	ERJ3GEYJ470	47	
R129	ERJ3GEYJ334	330k	
R130	ERJ3GEYJ102	1k	
R184	ERJ3GEY0R00	0	
R201	ERDS2TJ103	10k	
R202	ERJ3GEYJ124	120k	
R203	ERJ3GEYJ103	10k	
R204	ERJ3GEYJ394	390k	
R205	ERJ3GEYJ562	5.6k	
R206	ERJ3GEYJ183	18k	
R207	ERJ3GEYJ103	10k	
R208	ERJ3GEYJ472	4.7k	
R209	ERJ3GEYJ104	100k	
R301	ERJ3GEYJ225	2.2M	
R302	ERJ3GEYJ685	6.8M	
R304	ERJ3GEY0R00	0	
R305	ERJ3GEYJ221	220	
R310	ERJ3GEYJ223	22k	
R311	ERJ3GEYJ104	100k	
R312	ERJ3GEYJ104	100k	
R313	ERJ3GEYJ104	100k	
R320	ERJ3GEYJ103	10k	
R401	ERJ3GEYJ333	33k	
R403	ERJ3GEYJ473	47k	
R404	ERJ3GEYJ183	18k	
R405	ERJ3GEYJ333	33k	
R406	ERJ3GEYJ335	3.3M	
R407	ERJ3GEYJ222	2.2k	
R408	ERJ3GEYJ681	680	
R409	ERJ3GEYJ223	22k	
R410	ERJ3GEYJ474	470k	
R411	ERJ3GEYJ681	680	
R412	ERJ3GEYJ682	6.8k	
R421	ERJ3GEYJ182	1.8k	
R422	ERJ3GEYJ153	15k	
R423	ERJ3GEY0R00	0	
R424	ERJ3GEYJ334	330k	
R425	ERJ3GEYJ225	2.2M	
R426	ERJ3GEYJ272	2.7k	
R427	ERJ3GEYJ121	120	

Ref. No.	Part No.	Part Name & Description	Remarks
R428	ERJ3GEYJ562	5.6k	
R429	ERJ3GEY0R00	0	
R430	ERJ3GEYJ473	47k	
R432	ERJ3GEYJ223	22k	
R434	ERJ3GEYJ155	1.5M	
R435	ERJ3GEYJ182	1.8k	
R436	ERJ3GEYJ681	680	
R437	ERJ3GEYJ153	15k	
R438	ERJ3GEYJ473	47k	
R439	ERJ3GEYJ153	15k	
R440	ERJ3GEYJ473	47k	
R441	ERJ3GEYJ104	100k	
R442	ERJ3GEYJ104	100k	
R481	ERJ3GEYJ334	330k	
R482	ERJ3GEYJ155	1.5M	
R483	ERJ3GEYJ275	2.7M	
R600	ERJ3GEYJ152	1.5k	
R601	ERJ3GEYJ822	8.2k	
R602	ERJ3GEYJ122	1.2k	
R603	ERJ3GEYJ332	3.3k	
R604	ERJ3GEYJ472	4.7k	
R605	ERJ3GEYJ225	2.2M	
R606	ERJ3GEYJ303	30k	
R607	ERJ3GEYJ683	68k	
R608	ERJ3GEYJ682	6.8k	
R609	ERJ3GEYJ335	3.3M	
R610	ERJ3GEYJ104	100k	
R611	ERJ3GEYJ183	18k	
R612	ERJ3GEYJ472	4.7k	
R613	ERJ3GEYJ104	100k	
R614	ERJ3GEYJ473	47k	
R615	ERJ3GEYJ103	10k	
R617	ERJ3GEYJ472	4.7k	
R618	ERJ3GEYJ222	2.2k	
R619	ERJ3GEYJ103	10k	
R661	ERJ3GEYJ683	68k	
R662	ERJ3GEYJ333	33k	
R663	ERJ3GEYJ153	15k	
R664	ERJ3GEYJ474	470k	
R665	ERJ3GEYJ225	2.2M	
R666	ERJ3GEYJ475	4.7M	
R667	ERJ3GEYJ225	2.2M	
R801	ERJ3GEYJ105	1M	
R802	ERJ3GEYJ104	100k	
R803	ERJ3GEYJ101	100	
R814	ERJ3GEYJ104	100k	
R891	ERJ3GEYJ102	1k	
R892	ERJ3GEYJ102	1k	
R901	ERJ3GEYJ103	10k	
R902	ERJ3GEYJ103	10k	
R903	ERJ3GEYJ474	470k	
R921	ERJ3GEYJ103	10k	
R922	ERJ3GEYJ103	10k	
R923	ERJ3GEYJ683	68k	

Ref. No.	Part No.	Part Name & Description	Remarks
J3	ERJ3GEY0R00	0	
J4	ERJ3GEY0R00	0	
J110	ERJ3GEY0R00	0	
J111	ERJ3GEY0R00	0	
J115	ERJ3GEY0R00	0	
J120	PQ4R10XJ000	0	S
D310	PQ4R10XJ000	0	S
D311	PQ4R10XJ000	0	S
L401	PQ4R18XJ000	0	S
		(CAPACITORS)	
C1	ECQE2E105KZ	1	S
C2	ECEA1HU100	10	
C3	ECEA1HUR22	0.22	
C5	ECUV1H822KBV	0.0082	
C6	ECEA1HKA010	1	
C101	ECKD2H681KB	680p	S
C102	ECKD2H681KB	680p	S
C103	ECUV1H103KBV	0.01	
C105	ECEA1CU221	220	
C106	ECEA1HU100	10	S
C107	ECEA1AU331	330	
C108	ECUV1C104KBV	0.1	
C109	ECUV1H103KBV	0.01	
C111	ECUV1H103KBV	0.01	
C112	ECUV1C104KBV	0.1	
C113	ECUV1H333KBV	0.033	S
C114	ECEA1AU470	47	
C202	ECEA1EU470	47	S
C203	ECUV1H222KBV	0.0022	
C205	PQCUV1C224KB	0.22	
C301	ECA0JM471	470p	
C302	ECEA0JKA331	330	
C303	ECEA0JU331	330	
C304	PQCUV1H333JC	0.033	S
C306	ECUV1C104ZFV	0.1	
C308	ECEA0JKA221	220	
C404	ECUV1C104KBV	0.1	
C405	ECUV1C104KBV	0.1	
C406	ECUV1H180JCV	18p	
C408	ECUV1C104KBV	0.1	
C414	ECEA1CKA100	10	
C415	ECUV1H103KBV	0.01	
C421	ECUV1H333KBV	0.033	S
C422	ECUV1E223KBV	0.022	
C423	ECUV1H682KBV	0.0068	
C424	ECUV1H183KBV	0.018	
C425	ECUV1C104KBV	0.1	
C426	ECUV1C104KBV	0.1	
C435	ECUV1C104KBV	0.1	
C438	ECUV1C104KBV	0.1	
C481	ECUV1H103KBV	0.01	
C600	ERJ3GEY0R00	0	
C601	ECA0JM102B	0.001	
C603	ECUV1H333KBV	0.033	S

Ref. No.	Part No.	Part Name & Description	Remarks
C605	ECUV1E223KBV	0.022	
C606	ECUV1C683KBV	0.068	
C607	ECUV1C273KBV	0.027	
C608	ECUV1C153KBV	0.015	
C609	ECUV1C104KBV	0.1	
C610	ECEA1HKA010	1	
C611	ECEA1HKA010	1	
C612	ECEA1VKS4R7	4.7	S
C613	ECUV1C683KBV	0.068	
C614	ECEA1EU470	47	S
C615	ECEA0JU220	22	
C616	ECUV1C104KBV	0.1	
C617	ECEA1CKS470	47	S
C618	ECEA1VU330	33	S
C619	ECEA1VKS4R7	4.7	S
C620	ECUV1E183KBV	0.018	S
C621	ECEA0JKA101	100	
C622	ECUV1C104KBV	0.1	
C623	ERJ3GEY0R00	0	
C624	ECUV1H103KBV	0.01	
C625	ECEA1AU101	100	
C801	ECUV1H103KBV	0.01	
C802	ECUV1H120JCV	12p	
C803	ECUV1H150JCV	15p	
C804	ECUV1C104ZFV	0.1	
C805	ECUV1C104ZFV	0.1	
C806	ECUV1H102KBV	0.001	
C901	ECEA1CKA100	10	
C902	ECUV1H472KBV	0.0047	
C903	ECUV1H103KBV	0.01	
C904	ECUV1H103KBV	0.01	
C905	ECUV1H103KBV	0.01	
C921	ECUV1H332KBV	0.0033	
C922	ECUV1H152KBV	0.0015	
C923	ECUV1H152KBV	0.0015	
		(OTHERS)	
E1	PQJM122Z	MICROPHONE	
E2	PQMG10025Z	RUBBER, MICROPHONE	

15.2. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
		(ACCESSORIES)	
A1	PQJA10075Z	TEL CORD	
A2	PQJA212M	TEL CORD	
A3	PQJXC0102Z	HANDSET	
A4	PQKL10038Y1	STAND	S
A5	PQQX13159Z	INSTRUCTION BOOK	
		(PACKING MATERIALS)	
P1	PQPH89Y	PROTECTION COVER	
P2	PQPK13506Z	GIFT BOX	

16. FOR SCHEMATIC DIAGRAM (SCHEMATIC DIAGRAM)

1. DC voltage measurements are taken with electronic voltmeter from negative terminal.
   (Add 40 mA to telephone line from the loop simulator.)
2. This schematic diagram may be modified at any time with the development of new technology.

Important Safety Notice: / Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer´s specified parts.

16.1. MEMO

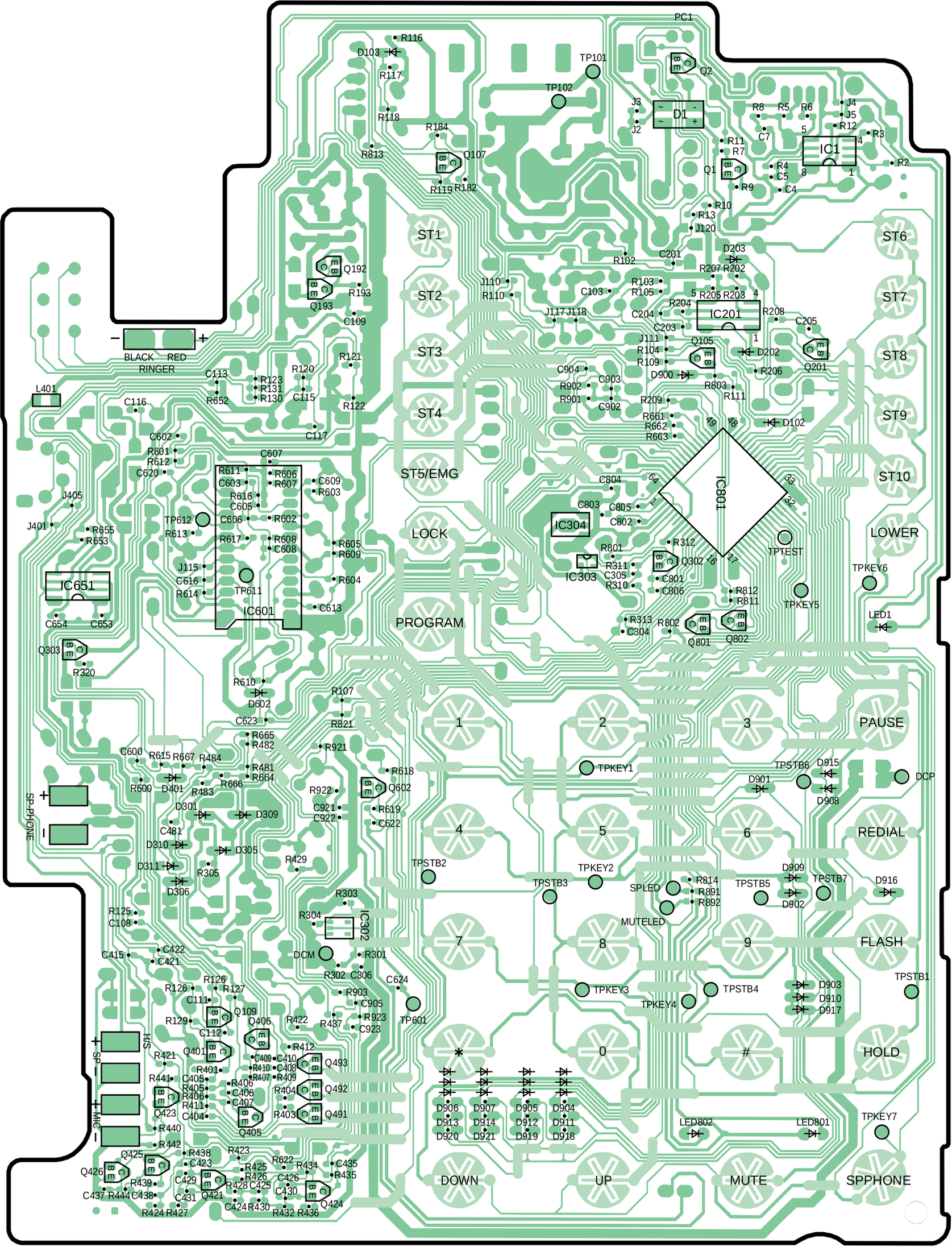
17. SCHEMATIC DIAGRAM

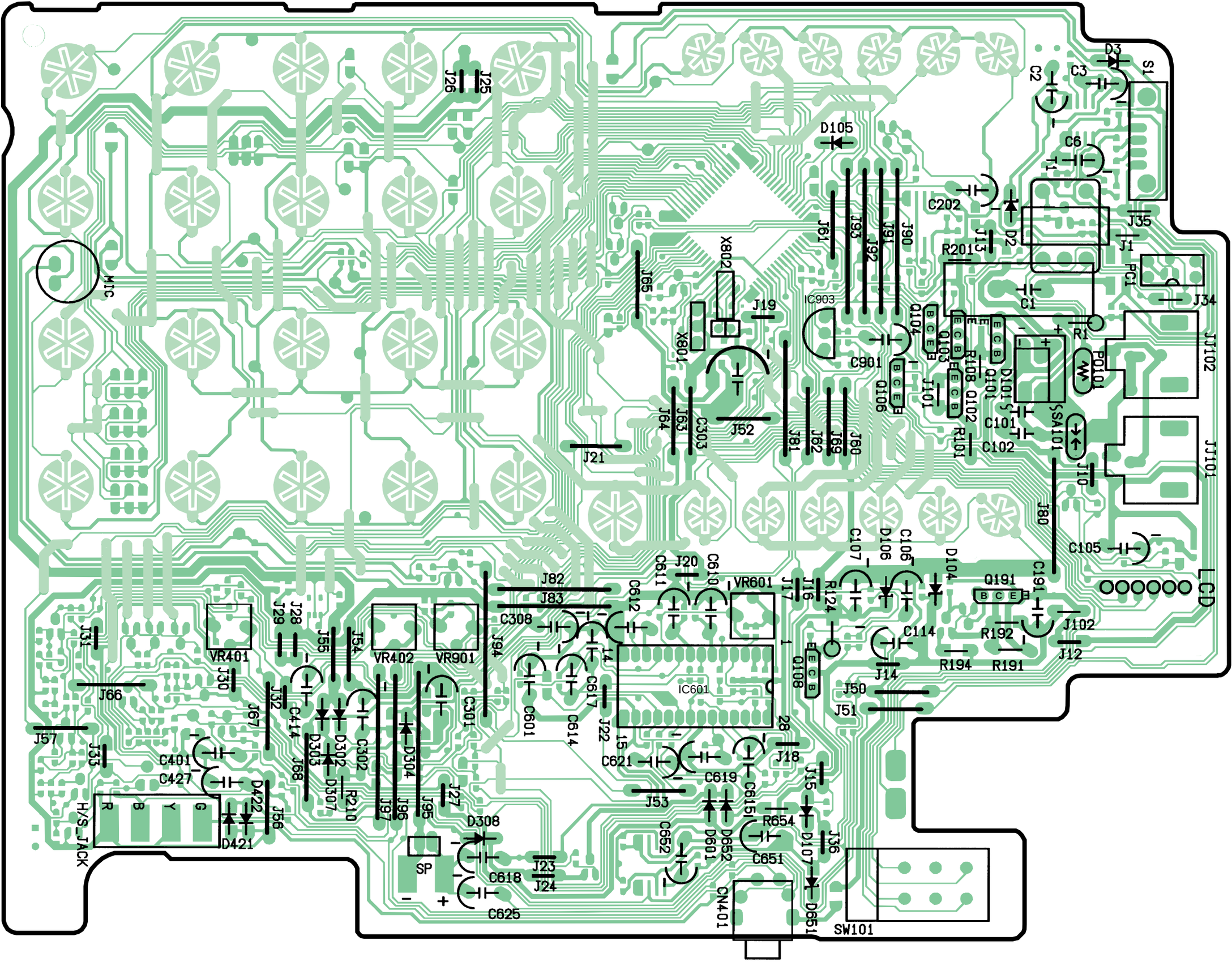
18. CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

18.1. Component Vie

18.2. Flow Solder Side View

H.M / KXTS105LXW / Printed in Japan


PC1
TP101
TP102
D103
R116
R117
R118
R813
R184
Q107
R119
R182
Q2
J3
J2
D1
R8
R5
R6
J4
J5
R12
C7
IC1
R11
R7
Q1
R4
C5
R9
C4
R3
R2
R10
R13
J120
ST1
ST2
ST3
ST4
ST5/EMG
LOCK
PROGRAM
ST6
ST7
ST8
ST9
ST10
LOWER
PAUSE
REDIAL
FLASH
HOLD
Q192
R193
Q193
C109
R102
C201
D203
R207
R202
J110
R110
C103
R103
R105
R205
R203
IC201
R204
C204
C203
J111
R104
R109
Q105
D900
R208
C205
D202
Q201
R206
R803
R111
C904
R902
R901
C903
C902
R209
R661
R662
R663
D102
C804
C803
C805
C802
IC304
IC801
R801
R311
C305
R310
IC303
R312
Q302
C801
C806
TPTEST
R812
R811
TPKEY5
TPKEY6
LED1
R313
C304
R802
Q801
Q802
L401
BLACK
RED
RINGER
C113
R652
R123
R131
R130
R120
C115
R121
R122
C116
C117
C602
R601
R612
C620
C607
R611
C603
R606
R607
C609
R603
R616
C605
C606
R602
R617
R608
C608
R605
R609
R604
C613
IC601
TP611
TP612
R613
R614
C616
J115
J405
J401
R655
R653
IC651
C654
C653
Q303
R320
R610
D602
C623
R665
R482
R107
R821
R921
R618
Q602
R619
C622
R922
C921
C922
C600
R615
R667
R484
R481
R664
R666
R600
D401
R483
D301
D309
C481
D310
D305
D311
R305
D306
R429
R303
IC302
R304
DCM
R301
R302
C306
C624
R903
C905
R923
C923
TP601
R422
R437
R412
Q493
Q492
Q491
Q406
R406
R407
R404
R403
C405
C406
C407
Q405
R405
R411
C404
Q423
R441
R401
C409
C410
C408
R410
R409
Q401
R421
C111
R126
R127
Q109
R129
C112
R125
C108
C415
C422
C421
R126
R438
R423
R425
R426
C425
R428
C426
C430
Q424
R432
R436
C435
R435
R622
R434
C423
C429
C431
Q421
C424
R430
Q425
Q426
R439
C437
R444
C438
R424
R427
R440
R442
SP-PHONE
SP+
SP−
MIC+
MIC−
HS
TPKEY1
TPKEY2
TPKEY3
TPKEY4
TPSTB2
TPSTB3
TPSTB4
TPSTB5
TPSTB6
TPSTB7
TPSTB1
SPLED
MUTELED
R814
R891
R892
D915
D908
D901
DCP
D909
D902
D916
D903
D910
D917
D906
D907
D905
D904
D913
D914
D912
D911
D920
D921
D919
D918
LED802
LED801
TPKEY7
DOWN
UP
MUTE
SPPHONE


MIC
H/S_JACK
R
B
Y
G
SP
LCD
SW101
CN401
IC601
IC903
X801
X802
VR401
VR402
VR901
VR601
SA101
PC1
PO101
D1
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D302
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D304
D307
D308
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D422
D601
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Q101
Q102
Q103
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Q106
Q108
Q191
C1
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C3
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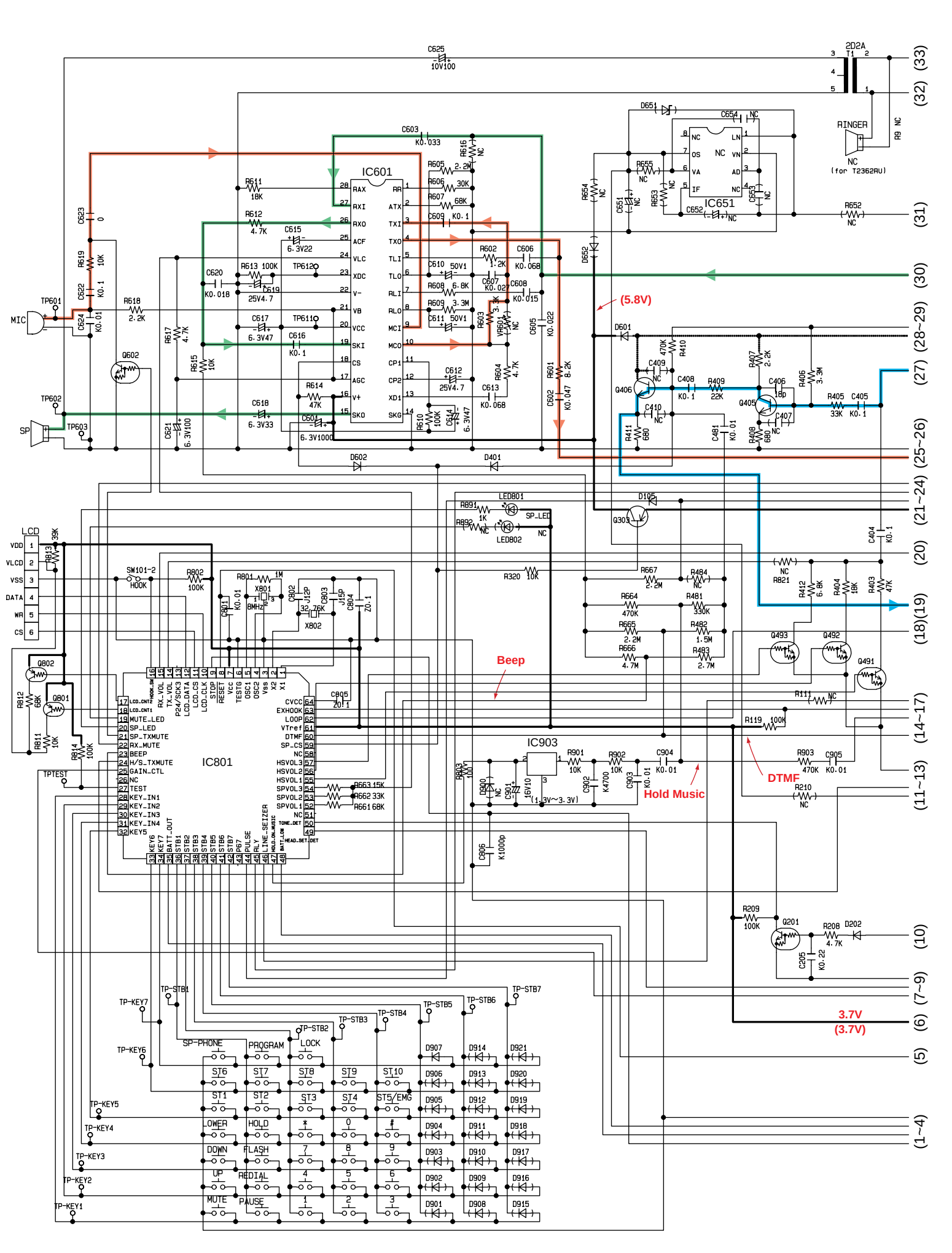
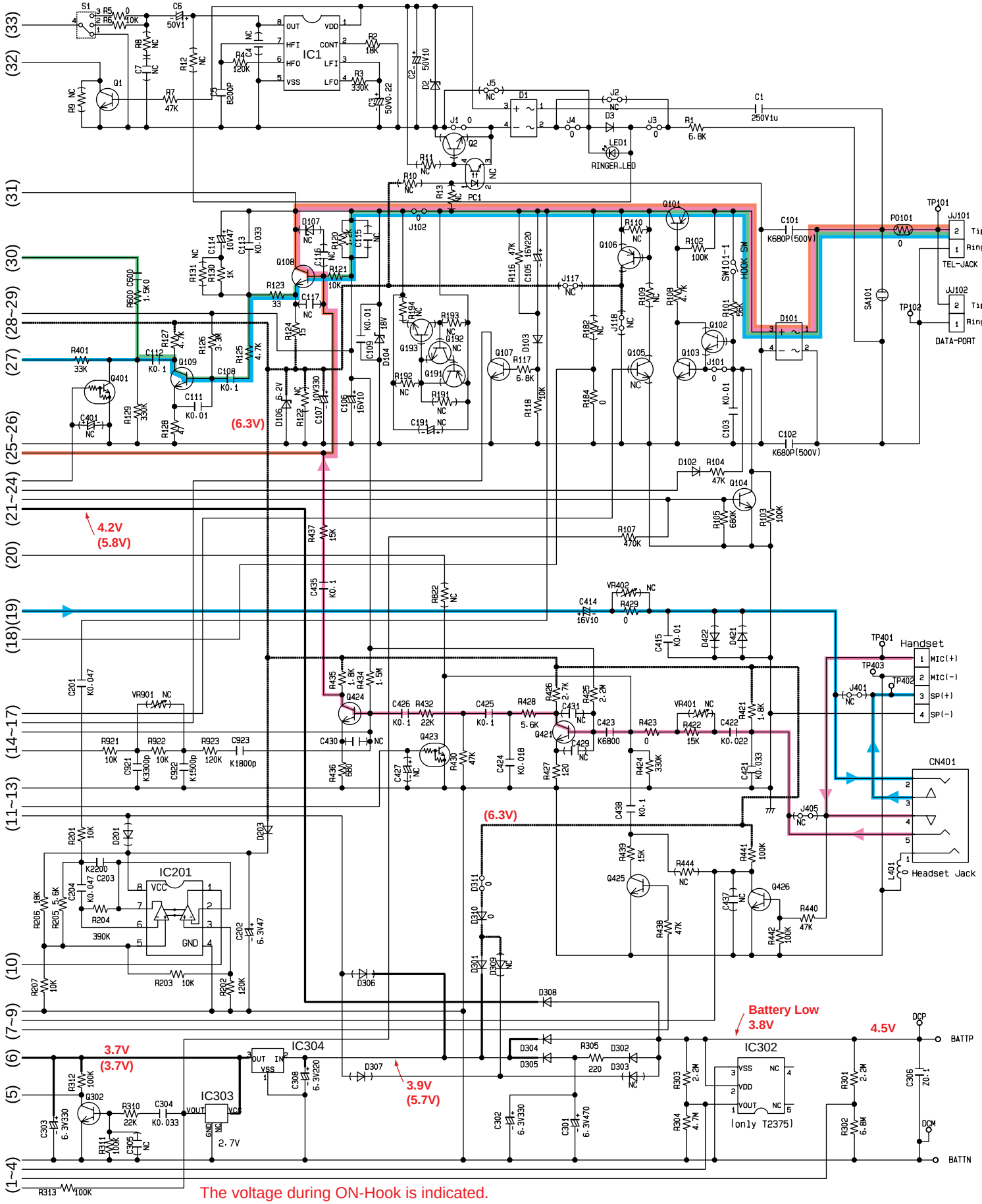
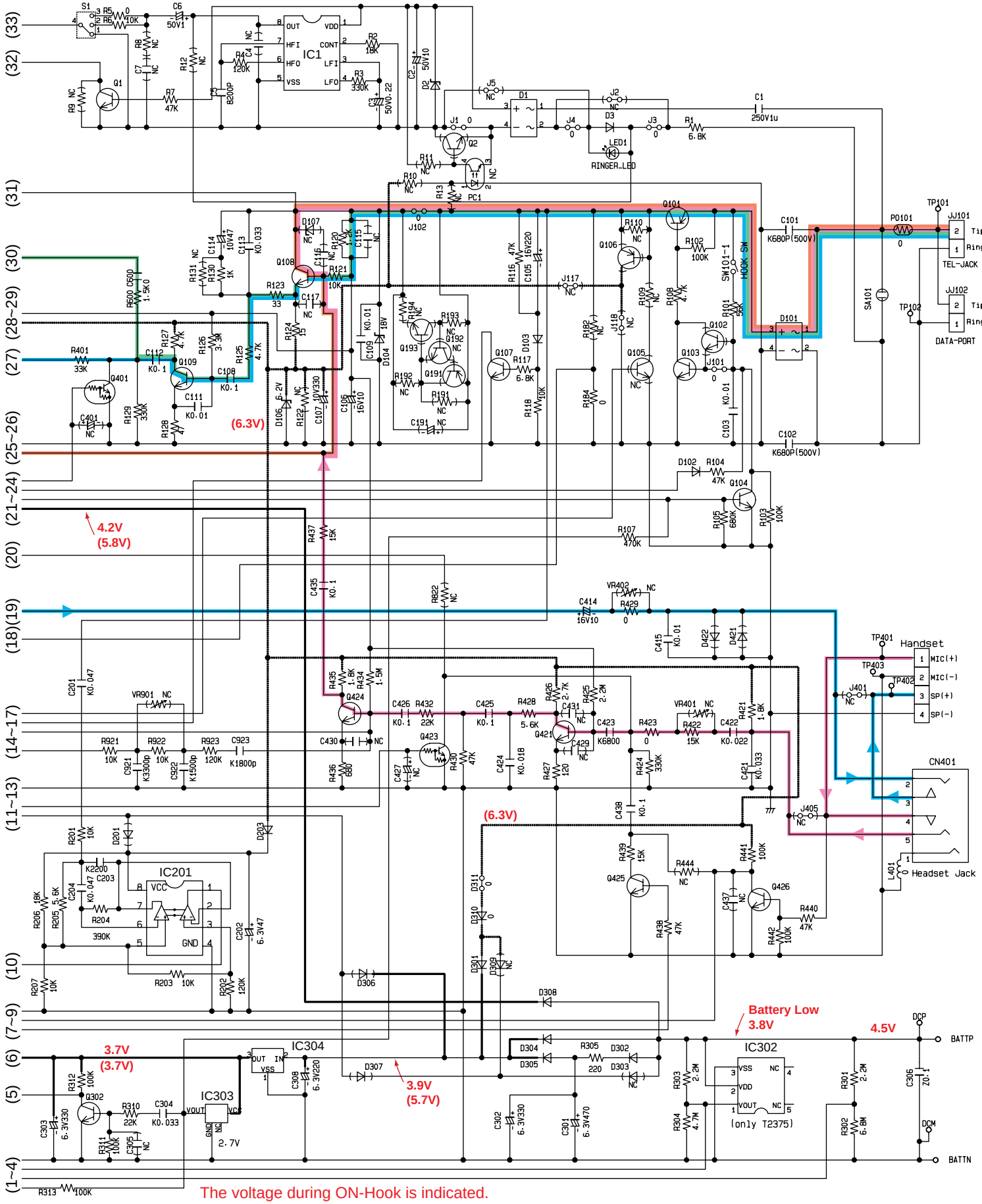
J94
J95
J96
J97
JJ101
JJ102
T1


IC601
IC651
IC801
IC903
2D2A
RINGER
(for T2362RU)
(5.8V)
Beep
DTMF
Hold Music
3.7V
(3.7V)
LCD
SP-PHONE
PROGRAM
LOCK
SP_LED
LED801
LED802
SW101-2
HOOK
TPTEST
MIC
SP
(33)
(32)
(31)
(30)
(28~29)
(27)
(25~26)
(21~24)
(20)
(18)(19)
(14~17)
(11~13)
(10)
(7~9)
(6)
(5)
(1~4)


IC1
IC201
IC303
IC304
IC302
(only T2375)
Handset
Headset Jack
DATA-PORT
TEL-JACK
RINGER_LED
HOOK SW
4.2V
(5.8V)
(6.3V)
3.7V
(3.7V)
3.9V
(5.7V)
2.7V
Battery Low
3.8V
4.5V
The voltage during ON-Hook is indicated.
( ) shows the voltage during OFF-Hook.
Headset Set & Headset Set Incoming Signal
Headset Set & Headset Set Outgoing Signal
Speaker Phone Incoming Signal
Speaker Phone Outgoing Signal


IC1
IC201
IC303
IC304
IC302
(only T2375)
Handset
Headset Jack
DATA-PORT
TEL-JACK
RINGER_LED
HOOK SW
4.2V
(5.8V)
(6.3V)
3.7V
(3.7V)
3.9V
(5.7V)
2.7V
Battery Low
3.8V
4.5V
The voltage during ON-Hook is indicated.
( ) shows the voltage during OFF-Hook.
Headset Set & Headset Set Incoming Signal
Headset Set & Headset Set Outgoing Signal
Speaker Phone Incoming Signal
Speaker Phone Outgoing Signal